

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING -- SHEET METAL CONTRACTING

Latest Interpretation of "Set-Aside" Order Page 55
Panel Heating—A Basic Discussion Page 68
Fundamentals of Roof Drainage Page 79

**.. ONE GOOD TURN
DESERVES ANOTHER**



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Products

C & L Blow Torches, Fire Pots

C & L Hoffman Water Heaters

Monarch builders finish hardware,
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Buckeye grain bins, corn cribs

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Specify C & L Lamneck furnace pipe fittings at
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AMERIC

HEAT... where You Need it - and when You Need it!

Use CLARAGE Unitherms in any Type of Industrial Building

Besides cutting fuel costs, Clarge Unit Heaters will help your plant maintain *top-level production* so dependent upon healthy, comfortable temperatures.

If you're still using wasteful coils, cast iron radiation, or obsolete unit heaters — investigate the features of our Unitherm Units!

FEATURES!



Centrifugal Fans



V-belt Drive

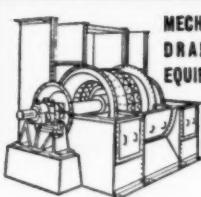
(1) Syncrotherm Control (exclusive improvement) maintains uniform temperatures with relatively **LOW TEMPERATURE**



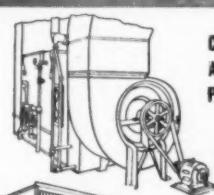
Adjustable Square Outlets

AIR — lower operating costs. (2) Centrifugal fans — one for each heater outlet — delivering heat over wide areas. (3) Square outlets for easy adjustment to four directions of heat flow. (4) V-belt drive insures quieter operation, greater flexibility of fan speed. (5) Every part accessible by removing front or back section of casing . . . Built in liberal range of sizes, operating on steam or hot water.

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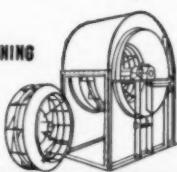


MECHANICAL DRAFT EQUIPMENT



CENTRAL STATION AIR CONDITIONING PLANTS

AIR CONDITIONING AND VENTILATING FANS

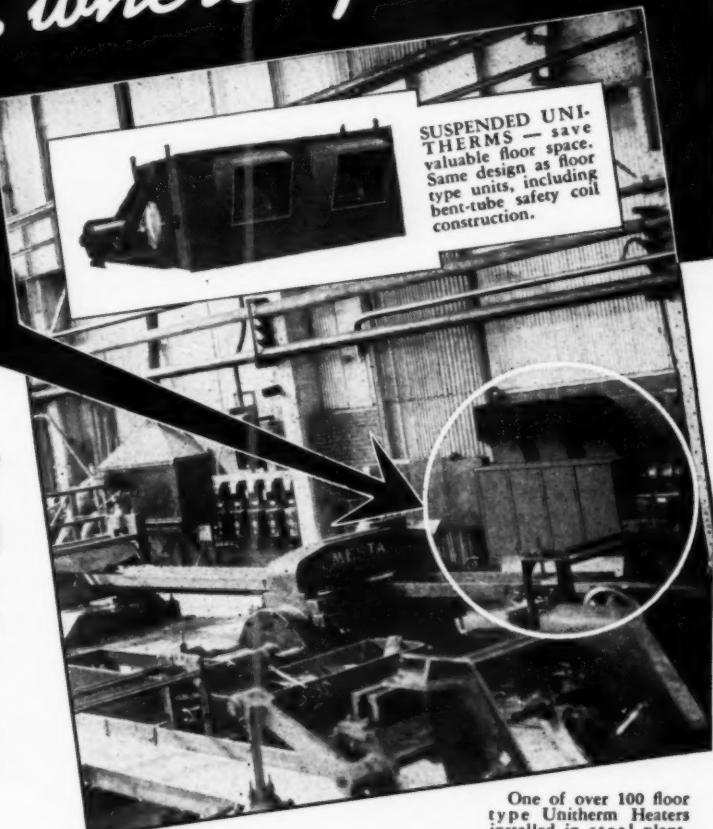


AIR WASHERS



CLARAGE
FAN COMPANY
Kalamazoo, Michigan

APPLICATION ENGINEERING OFFICES
IN ALL PRINCIPAL CITIES



SUSPENDED UNITHERMS — save valuable floor space. Same design as floor type units, including bent-tube safety coil construction.

One of over 100 floor type Unitherm Heaters installed in steel plant. This company has reordered eight times. Yes, Clarge Unitherms do the job!



And for Smaller Jobs

Clarco Unit Heaters (at right) are for small space heating, and for "spots" where more heat is needed than present equipment can supply. Exceptionally quiet — ideal for offices and stores as well as factory service. Wide range of sizes, using steam or hot water.

AMERICAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

ARTISAN

J. D. Wilder, Editor

J. J. McCullough, Associate Editor A. A. Kennedy, Assistant Editor

Contents

The Editor's Notebook	6
Latest Interpretation of the "Set-Aside" Order	55
News Summary of the Month	56
Kruckman—Is It Price or Profit Control	58
Sales Prospect—Handle With Care	60
The Parable of the Rotten Apples	61
At the Crossroads—Status of Reconversion	62
Association Activities	91
Equipment Developments	95
New Literature	106
With the Manufacturers	110

RESIDENTIAL AIR CONDITIONING SECTION

What's Ahead in Post War Stokers	67
Konzo—Panel Heating, A Basic Discussion	68
Neubecker—Pattern for a Three-Piece Offset	72
Back Draft and Condensation	74

SHEET METAL SECTION

Fundamentals of Roof Drainage	79
Contour Forming by Stretching	82
Melting Points of Metals and Alloys	84
Resistance Welding	86

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with which are merged
FURNACES
SHEET METALS
Warm-Air
Heating

In This
Issue

If telephone calls and letters are any indication, the latest order from Washington (the set-aside order) Schedules A and B to PR-33 is causing the utmost confusion throughout the industry.

To the best of our ability and based upon every shred of interpretation we can gather, the correct explanation of this order is presented in this month's editorial, page 55.

Evidently a lot of folks are not reading this order carefully. Or are jumping to conclusions because of some gossip they are hearing. The order is bad enough—let's not make it worse by thinking the order contains restrictions it does not contain.

Along this same line, Arnold Kruckman's Washington Letter (page 58) raises a pointed question—"Are OPA's intentions, today, really to control PRICES, or is OPA's real intention to control PROFITS."

If price control is the end sought, we can go part way with OPA, but if profit control is the aim, then it is high time every VOTER in this industry bestirs himself and makes it clearly known to everyone in government that this industry wants no part of profit control.

Price control has enough headaches, but profit control can mean just one thing—OPA wants to perpetuate itself as a permanent governmental agency and would like to control business activity, forever.

And we hope every subscriber will read carefully Professor Konzo's remarks on panel heating—one of the best explanations of basic radiant heating principles the editors have yet listened to.

Founded 1880

OCTOBER, 1946

Volume 115, No. 10

COAL Gravity OIL Forced Air GAS

MODERN

SYNCHROMATIC

STEEL FURNACES

"And it is no doubt the Greatest design advance toward Efficiency Beauty and Performance in furnaces in many years"—End Quote

—Studied Excellence!



Syncromatic Jobbers Say:

"The consumer appeal is the greatest we've ever seen and we like Syncromatic's jobber policy. Our dealers like the simplicity and ease of installation. Their profits are way up."

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TO OUR HEATING CONTRACTOR FRIENDS!

You can buy a chunk of postwar prosperity with this high quality, competitively priced line — write us. We'll have our jobbers contact you. Don't wait, good dealerships are getting scarce!

This Is Better Heating for Better Living

SYNCHROMATIC CORPORATION
WATERTOWN, WISCONSIN

The Editor's NOTE BOOK

Duct Estimating Tables

In the Editor's Notebook, August, page 12, reference was made to a booklet "Duct Estimating Tables." AA said of this book—

"Duct Estimating Tables gives the time required to fabricate straight sections and fittings, also sizes and weights of ducts so, from this information it is possible to estimate costs pretty closely.

Some contractors say these particular tables are very accurate. Such contractors generally are the more efficient shops. Less efficient contractors say the tables do not allow sufficient time. A few contractors have criticized the tables because they do not make what contractors believe are sufficient allowances for waste under present supplies of sheets."

Evidently, this book is of interest to many readers—requests for the book have been coming in every mail. The editors are sorry that the price of the book (50 cents) was not mentioned. To readers in Penna., Kan., Ind., Calif., Minn., Wisc., Ohio, Mass., Ariz., who asked for a copy, one has been sent with a bill—any other readers wanting a copy can save AA's bookkeeping department considerable work if they will send the 50 cents with their request. If you don't like the book, send it back and get a refund.

Glorious Russia

They're telling the story in Washington these days about the American newspaperman who, by some chance, took along a couple of mail-order house catalogues when he went to Russia.

In Moscow he showed the catalogues to the wives of some of the Red diplomats, and they were fascinated by the things the catalogue offered for sale: washing machines, refrigerators,

NEW



Here's a Sampsel product dealers have been wanting—safety and comfort that sells to an enormous market!

Sampsel Combination WARM AIR FAN AND LIMIT Control



A new and better Fan and Limit Control . . . improved design switches and simple, lock-screw adjustment.

RANGE	LIMIT	FAN
Stan. Model	100° to 375°F	100° to 300°F
Gas Model	135° to 250°F	100° to 200°F

Differential is adjustable, to minimum of 15°F. Sell it for the whole range of hand-fired furnaces, oil, stoker, or gas installations—with or without blowers. See your jobber or write SAMPSEL TIME CONTROL, INC., Spring Valley, Illinois.

Sampsel
TIME CONTROL, INC.

The Editor's NOTE BOOK

tors, vacuum cleaners, radios, underwear, suits, etc., etc., the merchandise, so reasonably priced, from America's manufacturers which the average citizen over here takes for granted as a part of living.

"Wonderful things!" the Soviet officials' wives gasped. "They are reserved, we suppose, only for the American government officials and their families? The common people can't buy them, of course?"

"But of course they can—any American can buy everything listed in the catalogues," the American newspaperman assured the amazed Reds.

"As a matter of fact," he added—and this really floored the Communist women—"as a matter of fact, Americans are BEGGED to buy them—all they want!"

Wants Bookkeeping System

American Artisan:

Can you tell me if there is a bookkeeping system for a sheet metal shop employing four men and doing all types of work?

R. S., Minn.

Gentlemen:

There is no bookkeeping system which we would recommend for the type of operation you describe. There have been numerous bookkeeping systems offered in the past, but most of these systems are now obsolete and do not produce the type of cost record and tax record which is so necessary today.

The Sheet Metal Contractors National Association has a committee which is undertaking an investigation of several bookkeeping systems and it is expected that some time this year the association will recommend one system which our industry can adopt. If you will be patient for the time being you will find such a system available before the end of the year.

AMERICAN ARTISAN

WEIR

WEIR
W-24-U

**DRUM, POUCH
and
DOOR SEATS
*All One Piece!***

Sell

**THIS MAJOR IMPROVEMENT IN
FURNACE DESIGN AND CONSTRUC-
TION! WEIR "U" SERIES STEEL FUR-
NACE WITH Integral Heating Element!***

1 Element shipped with doors attached. Doors and seats are surface ground for perfect fit. Leak-proof steel element.

2 Pressed steel "front" slides snugly over pouch. . . . is not exposed to fire. Casing hooks tightly to front, excluding dirt.

3 Here's the assembled "U" Series. It has smart, sales-building appearance and finer performance to match.

- New and modern — streamlined appearance and performance. The greatest improvement since Meyer introduced all-steel riveted-and-welded construction.
- Easier installation — no cumbersome front casting. Permanently, positively leak-proof; never needs re-cementing. Greatly improved cleanliness.
- All the famous lifetime WEIR features including smoke curtain, inside protecting collar, piano-type hinges, waist-high shaker handle, duplex grate, finger-touch door latch and others.

NOW IN FULL PRODUCTION!

Remember, WEIR-MEYER means MODERN HEAT! Send for full information now on the new WEIR "U" Series Furnace with Integral Heating Element!*

WEIR "U" Series Air Conditioner also available. All the advantages of the WEIR "U" Series Furnace plus rectangular casing of modern design for air conditioning.

THE MEYER FURNACE COMPANY

Mfrs. of WEIR & MEYER FURNACES • AIR CONDITIONERS for OIL • GAS • COAL
Offices: Peoria 2, Ill. Factories: Peoria and Peru, Ill.

*Patent applied for

THE MEYER FURNACE COMPANY
PEORIA, ILLINOIS

Since 1866

The Editor's NOTE BOOK

Evaporative Cooling

American Artisan:

I am sorry to bother you twice about the same article—"Evaporative Cooling"—but I want to be sure I understand the articles. My question is about the map on page 55 of the June issue. What do each of the five zones on this map represent? Possibly there is an explanation and I have overlooked it.

R. L., Illinois

Dear Sir:

In answer to your question, Zone I requires one air change every three minutes; Zone II, one air change every two minutes; Zone III, one air change every 1½ minutes; Zone IV, one air change every minute; and Zone V, one air change every half minute for satisfactory results with an evaporative cooler. Evidently on the copy which you received, this part of the legend was not included with the map.

Mr. Marsalis, the author of these articles, is not only a contractor, but also a manufacturer of evaporative cooling units—American Metal Products Company, P. O. Box 66, Sylvania Station, Fort Worth 9, Texas—and he has a very interesting sales manual which he sells for \$1.00. You might want to get a copy of this manual.

American Artisan

AFL and Prefab Houses

Said Richard Gray, acting Chairman, Executive Council, Building and Construction Trades Department, AF of L, in a radio roundtable on "What Is Holding Up Construction," July 7:

"A number of the organizations composing the Building and Construction Trades Department of the American Federation of Labor are at the present time under contract with employers who specialize in prefabricated houses. What we have been advocating is that if the housing shortage is

*...the labor-saving, time-saving Wells...
a low cost solution to your cut-off problems*



The No. 8 showing new Wells Wet Cutting System—an economical accessory available for all No. 8 Wells Saws.

WELLS No. 8

with wet cutting system

YOU WON'T find a better answer to all-around metal sawing problems than a versatile Wells. On miscellaneous cut-off jobs around the plant, or on steady production work, they can always be kept busy. Q A portable Wells will pay for itself quickly in your plant. Ask to see one in operation. Write for full details—or invite a representative to visit you.



The Editor's NOTE BOOK

to be corrected, we will have to do it with a mass-production program, and we contend that rather than ship a section of a prefabricated house two or three hundred miles, temporary mills could be erected on the job site where there are going to be anywhere from a thousand to two thousand houses developed, and with modern power equipment, instead of hand tools, prefabrication could be done at less cost on the job site than in some mill two hundred miles away. If it is done in the mill, the raw lumber has to be transported to the mill; it is prefabricated in the mill; then the section of the prefabricated house has to be transported to the job site, all increasing the cost in rehandling."

"Blow Pipe" Book

American Artisan:

Frequently our shop runs into problems requiring the design of fume removal, dust collecting, material waste collection. Our usual practice is to refer to previous similar jobs or, where this is not possible, we use standard hand books and engineer from basic formulas. We believe some sort of a book of "case examples" of such systems designed by others would serve as a reference and save a great deal of time. Do you know of such a book?

E. R., New Jersey.

Dear Sir:

We are very happy to send you a copy of our book "Correct Practice in Industrial Sheet Metal Work." This contains reprinted articles from American Artisan on a wide variety of fume removal, dust collection, waste material separation, ventilation, etc.

You will find in this book a number of examples of actual installations and in addition engineering data applicable to many types of work. The price of this book is \$1.00.

American Artisan

How W-R Controls Can Make YOUR EQUIPMENT WORK BETTER



**The same equipment
installed in identical
homes requires dif-
ferent adjustment**

External conditions such as exposure, prevailing winds and even the number of people in the house call for different requirements from a heating plant.

As the dials of White-Rodgers automatic tem-

perature controls are marked accurately in degrees Fahrenheit and the controls perform exactly as set anywhere within the range of the control, more and more manufacturers of heating equipment are adopting them as standard.



Upper left: Series 120 Room Thermostat is modern in design, finished in ivory and chrome to harmonize with any scheme of room decoration. Efficient and reliable.

Lower left: Series 500 Combination Fan and Limit Control for use on forced warmed-air heating systems. Provides accurate fan control and positive limit protection. Two independently operating controls in a single case.

Upper right: Series 3000 Gas Safety Pilot is simple in design and reliable in performance. Operates by difference in expansion of two stainless steel members. Automatically recycles, requires only relighting.

Lower right: Series 2600 Diaphragm Gas Valves give high capacity and smooth operation. May be operated manually in case of power failure. Also available with built-in limit control.



WHITE-RODGERS ELECTRIC CO.

ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air Conditioning

The Editor's NOTE BOOK

If Somebody Asks You

An executive has practically nothing to do, notes the magazine *Modern Industry*, except:

"To decide what is to be done . . . to tell somebody to do it . . . to listen to reasons why it should not be done . . .

"why it should be done by somebody else . . . or why it should be done in a different way . . . to follow up and see if the thing has been done . . .

"to discover why it has not been done . . . to inquire why it has not been done . . .

"to listen to excuses from the person who should have done it . . .

"to reflect that the person at fault has a wife and seven kids . . . and that certainly no other executive would have put up with him for another moment . . . he himself spent two days trying to find out why it was that it had taken somebody else three weeks to do it wrong . . .

"and then realized that such an idea would strike at the very foundation of the belief of all employees that . . . an executive has nothing to do."

Duct Size Book

American Artisan:

I am looking for a book giving standard formulas for figuring sheet metal duct work sizes for warm air furnace systems. The book must give all information needed so that I can figure the required Btu for each room and CFM volumes; also how to lay out the right size ducts for supply and return.

H. C. H., New Jersey

Dear Sir:

We recommend the two new codes and manuals prepared by the National Warm Air Heating and Air Conditioning Association. If you will send one dollar to Mr. George Boedener, Managing Director, National Warm Air Heating & Air Conditioning Association, 145 Public Square, Cleveland



MERCOID VISAFLAME

WHAT IT IS AND WHAT IT DOES

The Mercoid Visaflame is a highly efficient Oil Burner Control System, meeting the requirements of modern automatic fired boiler and furnace units.

The Visaflame supersedes the usual stack control, and actuates the control system direct at the source of flame in the combustion chamber. The Visaflame bulb itself is a small, specially designed mercury switch that may be located in or alongside the burner draft tube, where it is exposed to the view of the flame. It closes its circuit in the presence of the light from the flame and opens its circuit when the flame is absent. It is a mechanical operation and should not be confused with the photoelectric cell.

The Visaflame Control System offers many advantages to burner manufacturers and dealers alike. The operating control may be built within the burner, thereby enabling the manufacturer to feature a completely self-contained oil burner unit.

The dealer welcomes Visaflame equipped burners because there is less installation work and requires less service attention. The compact appearance has greater sales appeal.

The Visaflame Control has been thoroughly tried and assures complete satisfaction.

WHAT OTHERS SAY ABOUT IT

"The dependable service we have had through the use of the Mercoid Visaflame Control through the past five years has decisively convinced our company that it is the safest and most dependable safety control we can secure."

"We are pleased to advise that we have standardized on the use of Mercoid Visaflame Controls—as far as we have been able to ascertain, your Visaflames have given very satisfactory operation."

"Our experience with the Visaflame Controls in general has been very good."

"We have found this instrument an exceedingly good one and are well satisfied with its performance in every respect."

"We are glad to have this opportunity of telling you that the ensuing years since 1941 have proven further the dependability and value of the Visaflame Controls. As one of the first manufacturers to merchandise Visaflame equipped burners, we feel that we have a greater opportunity than most others to determine whether or not this new type control was an improvement and a benefit to the public. Time has proven this to be so in every respect."

Further information upon request.

THE MERCOID CORPORATION 4203 BELMONT AVE. CHICAGO 41-ILL.

The Editor's NOTE BOOK

14, he will mail you one copy of the code and manual for the design and installation of gravity systems and one code and manual for the design and installation of warm air winter air conditioning systems.

We believe that you will find the answer to all of your questions on duct sizing, velocities, cfm's, etc., clearly and simply explained in these two books.

AMERICAN ARTISAN



Economics

If all existing corporation profits, all dividends to investors and all incomes of \$25,000 or over were turned into employee wage accounts, "the total would hardly be enough to result in a 5 per cent wage increase across the board."

This statement was made recently by Hiland C. Batcheller, president of Allegheny Ludlum Steel Corp., to refute labor leaders' statements that still higher postwar purchasing power should come from profits.



Help! Help!

American Artisan:

In one of the trade journals, I read about an oil that can be heated hot enough to permit the solder to be sweated from tin in gas meters. Can you give us any information on this oil and where it may be obtained?

R. W. M., Kentucky

Dear Sir:

So far as we can determine, the item describing an oil which permits solder to be sweated from gas meters did not appear in American Artisan, and we do not have any idea where you might have seen this description. We are very sorry that we can not help you out.

Can any reader furnish information?

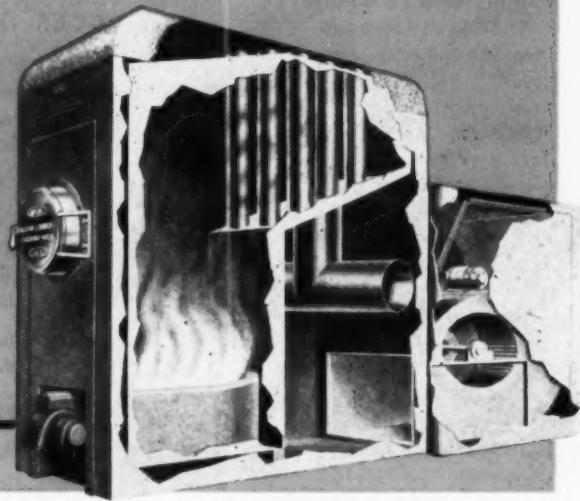
American Artisan

AMERICAN ARTISAN, October, 1946

Get the Big Profit Installations with J & C Power Heaters

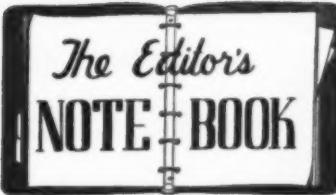


Custom-built heating service and efficiency at production-manufactured heater cost—that's what you assure owners of big buildings when you offer J & C Power Heaters. And that's a sales-getting, money-making advantage. There is real profit in installing heating systems in large structures such as stores, garages, churches, schools, warehouses, factories, and airport buildings. J & C Power Heaters, rated from 160,000 to 2,800,000 BTU, are ideal for these and other heavy-duty heating jobs. Their 90% direct radiation surface captures more heat for distribution by blower. Sturdy one-piece welded construction minimizes heat loss and prevents dust and soot from entering air stream. There are J & C Power Heaters designed to burn gas, oil, or coal. Compact construction occupies minimum floor and wall space, clean lines help assure a permanently trim installation. Inside and out, J & C Power Heaters sustain the slogan of Jackson & Church Company—"Work Well Done Since '81."



JACKSON & CHURCH COMPANY

WORK WELL DONE SINCE '81 • SAGINAW, MICHIGAN



Best Wishes, Mr. Lowe

American Artisan:

Please discontinue my subscription to American Artisan. I have sold my tools, rented my shop and will sell the stock to the man who takes over the business.

I have been actively engaged in the sheet metal and furnace business for fifty-three years. I am over seventy-two and cannot stand ladder work any longer.

I always enjoyed reading American Artisan and have learned much from it.

Daniel S. Lowe,
Harrisburg, Penna.

(American Artisan is sorry to lose this reader. Mr. Lowe was a continuous subscriber to American Artisan for more than 20 years).

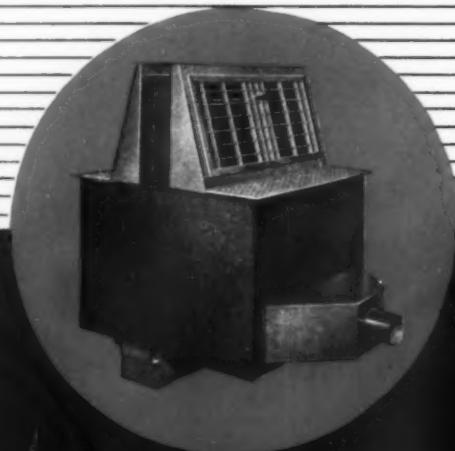
Gov't Corp. Still Fighting World War I

When Congressman Walter Norblad, of Oregon, was a 10-year-old lad, back in 1918, he noted with interest the creation out in his tall-tree country of the U. S. Spruce Corp. by the government—to help win World War I.

Recently the Congressman, now a grown man, was even more interested to find out that the government-owned corporation still was fighting the First World War.

"What's worrying me is this," said Mr. Norblad. "If we can't get rid of a World War I government-corporation in 28 years, then what's going to happen to our billion-dollar World War II corporations? They'll still be with us when my grandchildren are old, white-whiskered gentlemen!"

Seems that while no airplane ever was built of the corporation's World War I spruce, for which Congress originally spent \$23,500,000, each spring since 1922 Congress has been appropriating \$10,000 to liqui-



Order the new

ROYAL **DUAL-FLOOR FURNACE**

***For Greater
Profits Now***

**Most Models are available
for immediate delivery...**

TWO MEN INSTALLED EIGHT FURNACES IN A SINGLE DAY

Reports John F. Heberts of Hebert's Heating Company... ROYAL flat-bed furnaces are economical to install... two men, in a single day, have installed eight furnaces in new construction, and two in homes already built.

The ROYAL Dual-Floor Furnace slips into place from above the floor... shallow flatbed construction eliminates basement or pit. (fire-box only 18" deep).

***For greater profits now, write for
information and prices—TODAY!***

ROYAL HEATERS, INC.

1024 Westminster Ave. • Alhambra, Calif.
(Dept. A-10)



date the lumber company.

It's not liquidated yet. The government corporation, operating on a government basis, paying no taxes on its stands of timber, its railroad or its sawmills, is run by a retired Army colonel and other employees—including a government chauffeur to drive the Colonel to his office in a government car!

Hay Curing Article

American Artisan:

Your article on "Barn Hay Curing Systems" in the June issue is very interesting and we would like to know if you can tell us where, in our area, there are such installations. We would like to see and study these at first hand.

J. G. S., Tenn.

Dear Sir:

We do not know where there are specific nearby hay curing systems in your area, but Mr. John A. Schaller, Agricultural Engineering Development Division, Tennessee Valley Authority, Knoxville, Tennessee, is supposed to be quite an authority on this subject and has been very active in hay curing research. We believe that if you will contact him, you will probably get an answer to your question.

American Artisan

Where Are the Motors?

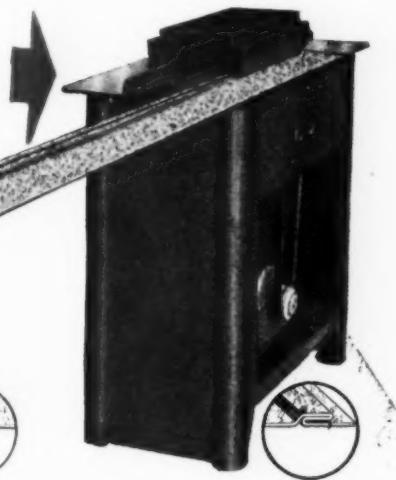
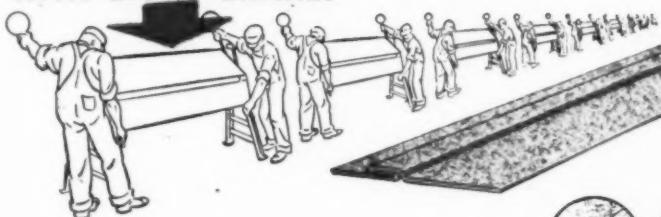
The average American home contains from six to a dozen fractional horsepower motors, the Civilian Production Administration estimates. The shortage of these small motor components for warm air furnaces results from their diversion to other home uses such as refrigerators, fans, vacuum cleaners, sewing machines, washing machines, electric clocks, kitchen mixers, ironing machines and phonographs.

**HIS IS THE MACHINE
THAT HAS REVOLUTIONIZED
SHEET METAL FABRICATION!**

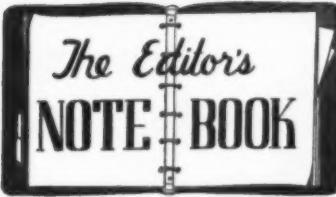
THE LOCKFORMER

Even the smallest Lockformer will double the production capacity of any shop still using hand methods. Because it cuts fabrication time at least 50%, it pays for itself quickly out of extra profits—keeps on deducting dollars from your "cost" column and adding them to your "profit" column . . . every time you use it!

**ONE MAN WITH A LOCKFORMER CAN MAKE MORE
PITTSBURGH LOCKS THAN SIXTEEN MEN
WITH EIGHT BRAKES**



THE LOCKFORMER CO.
4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS



Best Wishes, Mr. Lowe

American Artisan:

Please discontinue my subscription to American Artisan. I have sold my tools, rented my shop and will sell the stock to the man who takes over the business.

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Harrisburg, Penna.

(American Artisan is sorry to lose this reader. Mr. Lowe was a continuous subscriber to American Artisan for more than 20 years.)

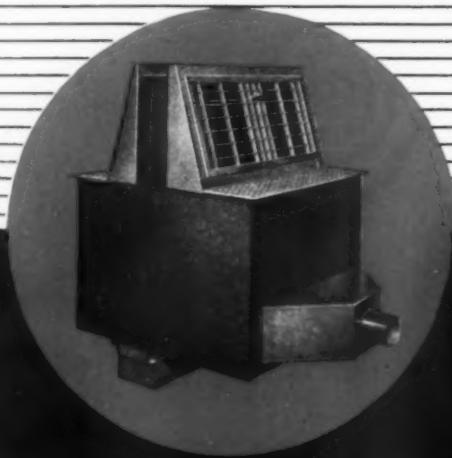
Gov't Corp. Still Fighting World War I

When Congressman Walter Norblad, of Oregon, was a 10-year-old lad, back in 1918, he noted with interest the creation out in his tall-tree country of the U. S. Spruce Corp. by the government—to help win World War I.

Recently the Congressman, now a grown man, was even more interested to find out that the government-owned corporation still was fighting the First World War.

"What's worrying me is this," said Mr. Norblad. "If we can't get rid of a World War I government-corporation in 28 years, then what's going to happen to our billion-dollar World War II corporations? They'll still be with us when my grandchildren are old, white-whiskered gentlemen!"

Seems that while no airplane ever was built of the corporation's World War I spruce, for which Congress originally spent \$23,500,000, each spring since 1922 Congress has been appropriating \$10,000 to liqui-



Order the new

ROYAL **DUAL-FLOOR FURNACE**

*For Greater
Profits Now*

**Most Models are available
for immediate delivery...**

TWO MEN INSTALLED EIGHT FURNACES IN A SINGLE DAY

Reports John F. Heberts of Hebert's Heating Company... ROYAL flat-bed furnaces are economical to install... two men, in a single day, have installed eight furnaces in new construction, and two in homes already built.

The ROYAL Dual-Floor Furnace slips into place from above the floor... shallow flatbed construction eliminates basement or pit. (fire-box only 18" deep).

For greater profits now, write for information and prices—TODAY!

ROYAL HEATERS, INC.

1024 Westminster Ave. • Alhambra, Calif.
(Dept. A-10)



date the lumber company.

It's not liquidated yet. The government corporation, operating on a government basis, paying no taxes on its stands of timber, its railroad or its sawmills, is run by a retired Army colonel and other employees—including a government chauffeur to drive the Colonel to his office in a government car!

Hay Curing Article

American Artisan:

Your article on "Barn Hay Curing Systems" in the June issue is very interesting and we would like to know if you can tell us where, in our area, there are such installations. We would like to see and study these at first hand.

J. G. S., Tenn.

Dear Sir:

We do not know where there are specific nearby hay curing systems in your area, but Mr. John A. Schaller, Agricultural Engineering Development Division, Tennessee Valley Authority, Knoxville, Tennessee, is supposed to be quite an authority on this subject and has been very active in hay curing research. We believe that if you will contact him, you will probably get an answer to your question.

American Artisan

Where Are the Motors?

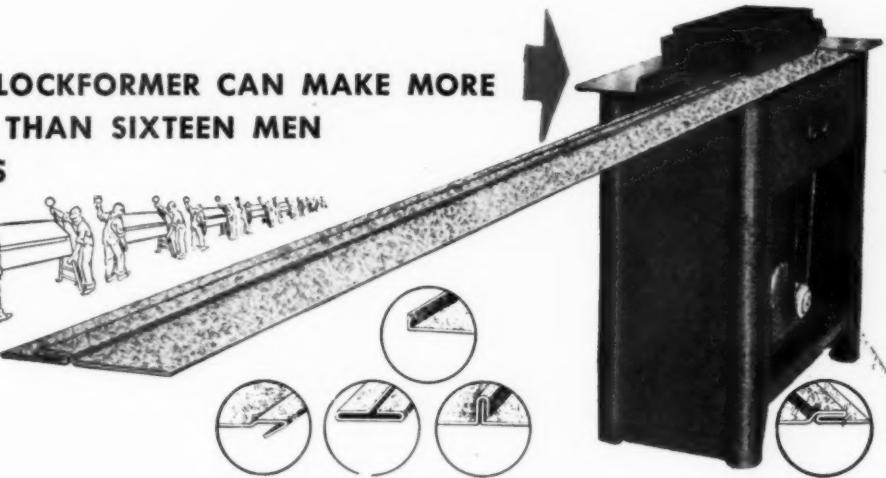
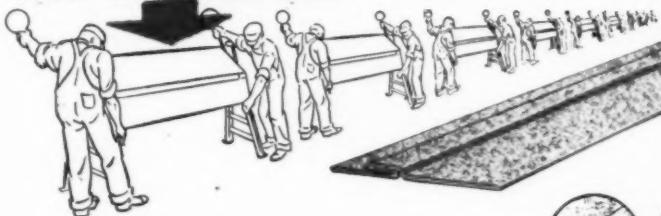
The average American home contains from six to a dozen fractional horsepower motors, the Civilian Production Administration estimates. The shortage of these small motor components for warm air furnaces results from their diversion to other home uses such as refrigerators, fans, vacuum cleaners, sewing machines, washing machines, electric clocks, kitchen mixers, ironing machines and phonographs.

**HIS IS THE MACHINE
THAT HAS REVOLUTIONIZED.
SHEET METAL FABRICATION!**

THE LOCKFORMER

Even the smallest Lockformer will double the production capacity of any shop still using hand methods. Because it cuts fabrication time at least 50%, it pays for itself quickly out of extra profits—keeps on deducting dollars from your "cost" column and adding them to your "profit" column . . . every time you use it!

**ONE MAN WITH A LOCKFORMER CAN MAKE MORE
PITTSBURGH LOCKS THAN SIXTEEN MEN
WITH EIGHT BRAKES**



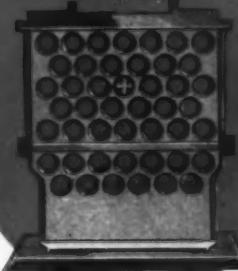
THE LOCKFORMER CO.
4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS

Coroaire
PATENTED
The Scotch Heater

A Remarkable New Invention CONSOLE GAS FIRED HEATER



This is the patented Venturi tube heat exchanger . . . exclusive with COROAIRE . . . and the heart of every COROAIRE unit.



CAST IRON

Here is automatic winter air-conditioning—cleaned—filtered—humidified heating—in a unit no bigger than a console radio! At an unbelievably high efficiency and low cost, COROAIRE heats a one-floor five to six room space without extreme temperature differentials. It's the perfect heater—not only for homes, but for stores, offices and all kinds of small business places. And it's easy to install!

5 Profit-Points for Dealers

1. Exclusive patented Venturi tube heat exchanger, made of cast iron.
2. Five-to-one wiping surface that heats more economically—holds heat longer.
3. Patented restricted inside-flue travel that holds gases—retards escape of heat.
4. Patented adjustable revolving grill.
5. Proved economy of operation.

*Read what people say:

A user: "The economy of its operation is astonishing."

A dealer: "Our service problems have been practically nil. Coroaire is far superior to any heater we know of."

A builder: "I've installed many types of heating equipment in homes I have built, but Coroaire is the most efficient and economical."

A user: "After two heating seasons, we unqualifiedly recommend Coroaire equipment. Hope others will profit by our experience."

*Letters on file

CHECK THESE FEATURES:

Winter air conditioning
Heats
Filters
Cleanses

Humidifies
No larger than console
radio
Capacity

100% thermostatic and
automatic
Control
High efficiency

Economy
Compact small size
Design and finish
Complete safety controls

THE COROAIRE HEATER

A Sensational New Stride in Heating!

THE Coroaire HI-BOY



GAS FIRED
WINTER AIR CONDITIONER

NOW! A brand new basement-installed gas heating unit—with the same remarkable efficiency and economy as the COROAIRe console heater—and the same profit advantages! That's the COROAIRe HI-BOY! It heats, cleans, humidifies and filters for complete winter air conditioning.

Here's the answer

The heart of the COROAIRe HI-BOY is the famous patented Venturi tube heat exchanger, made of cast iron. That means greater efficiency, greater distribution of heat, greater heating capacity. You get it because of a 5 sq. in. to 1 sq. in. wiping surface on the exterior and a 28-foot flue travel—against 6 to 8 foot flue travel on other conventional types of heat exchangers. It's the dream of every heating engineer, builder, distributor, dealer and user!

The COROAIRe HI-BOY is sturdily built—finished in Blue Hammerloid enamel. A.G.A.-approved controls—quiet operation—complete safety features. Write today for Booklet c-802 for full information and specifications. The Coroaire Heater Corporation, Hanna Building, Cleveland 15, Ohio.

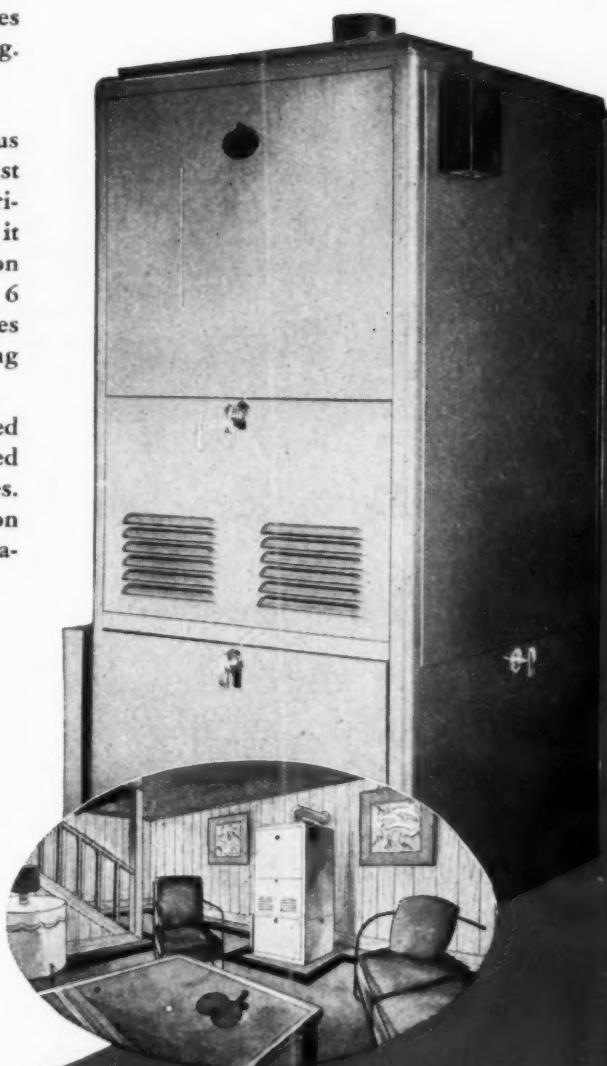
SPECIFICATIONS

COROAIRe HI-BOY—Model 85-S-HB

width overall.....	28"
depth overall.....	32"
height overall.....	60"
intake (cold air).....	16" x 25"
discharge.....	8" x 25"

COROAIRe CONSOLE SPACE HEATER— Model 85G

height overall.....	40"
width overall.....	26"
depth overall.....	18"
propeller type fan.....	18"



The COROAIRe HI-BOY is so completely a self-contained package unit that it will fit into any basement decorative scheme.

CORPORATION • CLEVELAND 15, OHIO



SAFETY For ECONOMY Make Sure Your* Gas Controls are SERVICE



*L. P. G. BUTANE—NATURAL

STANDARD REMOTE CONTROL VALVES, by consistent performance, dependability, durability, have become the accepted standard wherever gas is used. STANDARD REMOTE CONTROL VALVES are simple in design, sturdy in construction, compact, convenient to install, absolutely automatic in operation. They are engineered to exact A.G.A. and

National Board of Fire Underwriters requirements, and no consumer of gas for power, heat, or any processing purpose can afford to accept less than the established "Standard" of efficiency.

Illustrated here, ready for immediate delivery, are seven of the most universally used types of Standard Remote Control Valves. Other types are available. Submit your blueprints and specifications for prompt estimates.



STANDARD REMOTE CONTROL VALVE COMPANY
205-211 PASADENA AVENUE • SOUTH PASADENA, CALIFORNIA
PIONEERS IN GAS CONTROL SINCE 1924



Plus Features that will SELL MORE...



The smart styling and bright finish of the new CONCO STOKER give it a **QUALITY** look, that attracts prospects. And a detailed story of the **QUALITY** that is built into this stoker turns prospects into customers. This stoker's beauty is, indeed, more than skin deep.

CONCO STOKERS

No other stoker can offer a home-owner greater comfort or greater convenience. And no other fuel can match the heating economy of coal burned in this new CONCO STOKER.

FIELD ★ ★
BAROMETRIC
DRAFT CONTROLS
are STANDARD
with CONCO

BUILDERS OF A COMPLETE HEATING LINE

- DOMESTIC STOKERS
- COMMERCIAL STOKERS
- GAS-FIRED AIRCONDITIONERS
- OIL-FIRED WATER HEATERS
- STEEL FURNACES
- OIL-FIRED AIRCONDITIONERS

CONCO ENGINEERING WORKS • MENDOTA, ILLINOIS



IT'S
THE NEW
CONCO
DOMESTIC
STOKER

general purpose transformer relays



for
Automatic
**HEATING
EQUIPMENT**

Perfex Transformer-Relays are used for heating equipment, pumps, motors and wherever single phase, low voltage control of electrical circuits is desired. Quiet and hum-free in operation, compact and easy to install both the Standard and Universal Relay contribute materially to the satisfactory performance of all types of automatic heating equipment.

STANDARD TRANSFORMER RELAY is designed to control single-phase motors from remote, low-voltage, two-wire snap-action controllers. It has common load and line supply circuits and single-pole single throw switching circuit.

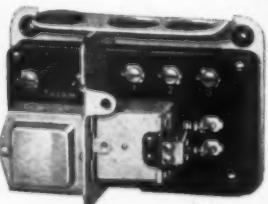
UNIVERSAL TRANSFORMER RELAY may be used with a variety of thermostat circuits or operating devices. Flexibility of application is provided by isolating line supply and load circuits. Universal Relays are available in either single pole, single throw or double pole, single throw circuits.

Superior Perfex engineering skill, years of experience and field-proven performance have influenced leading manufacturers of automatic heating equipment to standardize on Perfex Twin Contact Controls as original factory accessories.

PERFEX CORPORATION, MILWAUKEE 7, WIS., • Perfex Controls Ltd., Toronto 1, Ont.

OUTSTANDING FEATURES

- Hum-free operation.
- Mounts in any position or angle.
- Heavy contacts—for long life.
- Rugged switch mechanism takes full 1 H.P. load.



PERFEX

TWIN CONTACT CONTROLS

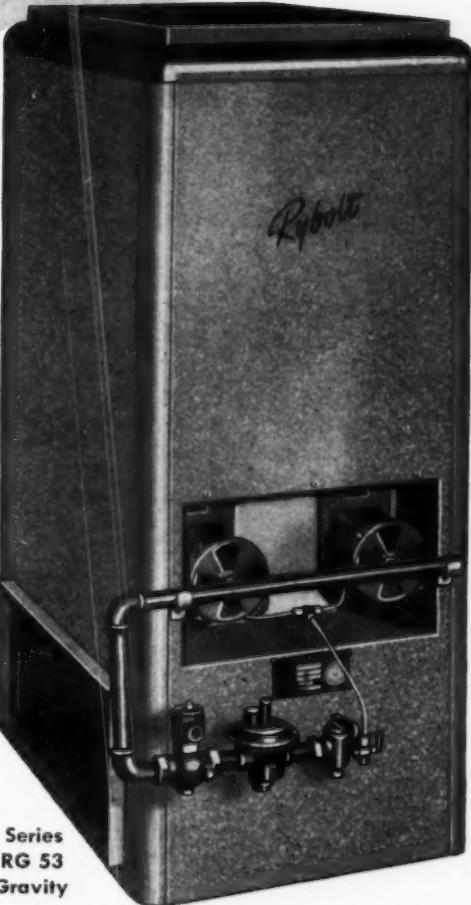
MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES
OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES



Series RG 54
Forced Air

Rybolt maintains
its quality standard
in its...

NEW GAS FURNACES
Forced Air and Gravity



Series
RG 53
Gravity

The new line of Rybolt gas furnaces represents a real achievement in gas heating engineering. Unusually compact to conserve space, easy to install and service and thoroughly modern in attractive design and finish, it fully maintains the Rybolt quality standard in every detail.

Incorporating many advanced engineering features this new line of forced air and gravity gas furnaces will give your customers the fullest measure of gas heating comfort, convenience and economy. Approval tests have been

made by American Gas Association Testing Laboratories. Quantity production will soon be in full swing.



THE RYBOLT HEATER COMPANY
615 MILLER STREET

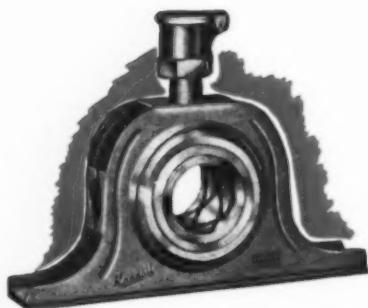


ASHLAND, OHIO

FOR QUIET, TROUBLE-FREE OPERATION

specify

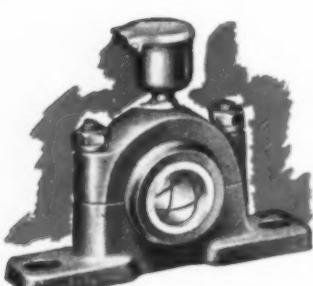
RANDALL PILLOW BLOCKS



ONE-PIECE STEEL HOUSING PILLOW BLOCK—Either Double or Single Oil Reservoir



NEW STREAMLINED ONE-PIECE STEEL HOUSING PILLOW BLOCK
Either Double or Single Oil Reservoir



STANDARD PILLOW BLOCK
Single Oil Reservoir

Silent, dependable operation contributes more to building good will and customer satisfaction in the heating and air conditioning industry than any other one factor. Quiet installations keep 'em happy.

That's why you find Randall Self-Aligning, Self-Lubricating Pillow Blocks on such a large percentage of the finest air-handling equipment. Because they are built to the highest quality standards they will last the life of the equipment on which they are used with only a minimum of attention.

For the quiet, dependable and economical solution to your bearing problems consult Randall Engineers. Write today for catalog No. 42, addressing department 1011.

Randall

GRAPHITE PRODUCTS CORPORATION
609 WEST LAKE ST., CHICAGO, ILLINOIS

Representatives Carrying Stocks

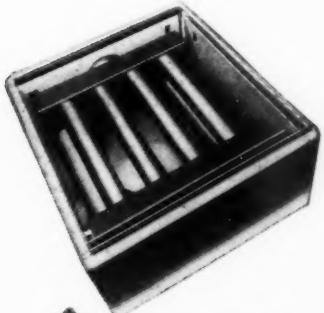
C. W. Marwedel,
San Francisco, Calif.

Tek Bearing Company,
177 Lafayette Ave., New York 13
510 Cambridge St., Boston 34

Salt Lake Hardware Company,
Salt Lake City, Utah

Edward D. Maltby Company,
1718 Flower Street
Los Angeles 15, Calif.

The new Mueller Climatrol Type 101 Gas-Fired Gravity Furnace: 2 sizes—maximum B.t.u. input 90,000 and 135,000. AGA approved for operation with natural, mixed, or manufactured gas, liquefied petroleum gas, and at high altitudes.



Special Radiator Design for Uniform Heat: Evenly-spaced steel radiator tubes, close to the sides of the cabinet, provide uniform heat rise from all parts of the radiator to every room in the house—for true heating efficiency.

**Give your
customers
clean, convenient,
comfortable heat
—with this new
Mueller
Climatrol
Gas Furnace**

Here's a new Climatrol Gas Gravity Furnace which gives your customers the true indoor comfort they demand today. Designed for gas, it furnishes clean, dust- and dirt-free heat. Temperature is maintained at a constant comfort-level with complete thermostatic control. Burner, heat exchanger, and controls are designed and constructed to operate at maximum efficiency — to deliver the utmost comfort with satisfying economy. With its modern styling and dependable performance, the new Mueller Type 101 Gas Gravity Furnace is a unit you can recommend with confidence and pride. Write for complete information.

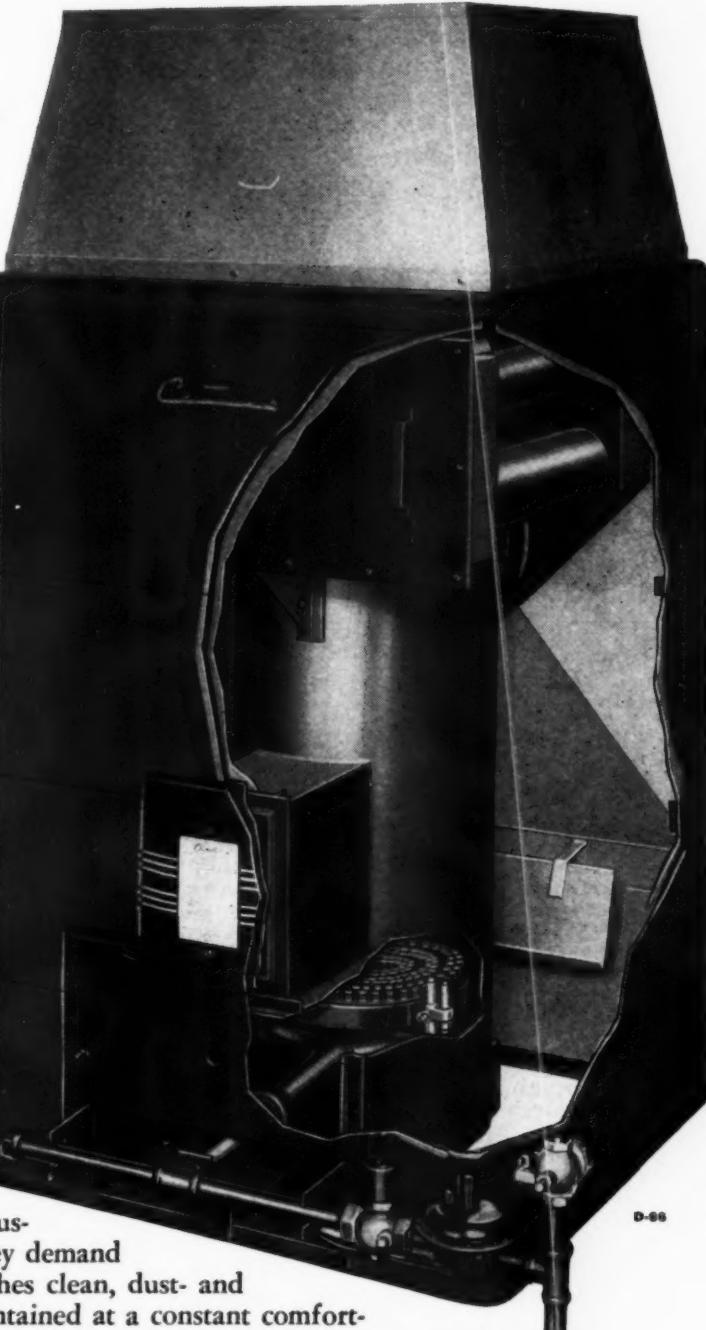


L. J. Mueller Furnace Co., 2010 W. Oklahoma Ave., Milwaukee 7, Wis.

MUELLER

Climatrol

REG. U. S. PAT. OFF.





... for more heat with less fuel, LESS DIRT!

Whether you are planning a simple cottage or a mansion, and irrespective of the type of fuel you intend to use, you'll find *modern warm-air heat* offers important advantages—in comfort, low operating costs and cleanliness.

Yes, modern warm-air heat is *clean*, thanks to efficient, inexpensive, replacement-type filters installed in the blower compartments. And it provides moisture that helps to keep wood furniture from drying out.

Besides saving on fuel, cleaning of draperies and premature replacement of furniture, you'll enjoy temperatures set to your personal comfort, then automatically controlled. But get all the facts about this finer home heating. Consult your local builder, architect or heating contractor!

DUST-STOP® Air Filters are standard equipment in most modern warm-air furnaces and air conditioners. Dust-Stops for replacement cost little, are available everywhere. Change them twice a year for best results. Dust-Stops are a product of Owens-Corning Fiberglas Corp., Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Toronto, Ontario.



DUST-STOP
U.S. REG. U.S. PAT. OFF.
Air Filters
a FIBERGLAS product



YEAR IN! YEAR OUT!

DUST-STOP ADVERTISING SELLS 2 BIG IDEAS

- For more than *ten years* DUST-STOP advertising has appeared in general magazines reaching millions of homemakers. Purpose of such advertising, obviously, is to sell filters. But, DUST-STOP advertising does much more.

Since the earliest days of the industry, DUST-STOP advertising has supported and aggressively promoted *modern, mechanically-circulated warm-air heat*, supported the industry by reminding your customers that dirt-clogged filters waste fuel, impair circulation of the heated air; promoted the industry by extolling at every opportunity the manifold advantages of modern warm-air heating.

As in the advertisement shown at the left, appearing in the November issues of *Better Homes & Gardens* and *House Beautiful*, and the fall edition of *Small Homes Guide*, DUST-STOP advertising will continue to sell *two big ideas*: (1) that *modern warm-air heating* is "tops"; (2) that replacement of dirty filters with clean ones improves heating performance, saves fuel and money.

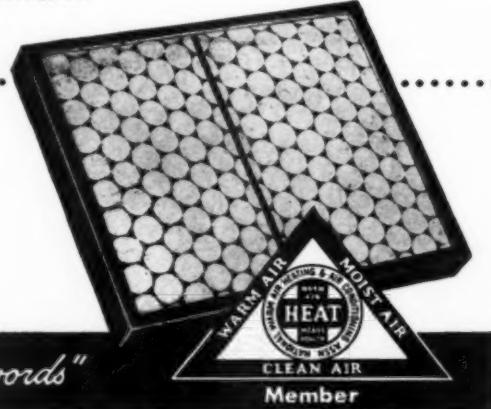
We think that's good advertising . . . for us as well as the industry. Owens-Corning Fiberglas Corp., Department 930, Toledo 1, Ohio.

In Canada, Fiberglas Canada Ltd., Toronto, Ontario

*T. M. Reg. U. S. Pat. Off.

**OWENS-CORNING
FIBERGLAS CORPORATION**

"Your partner whose Actions speak louder than words"



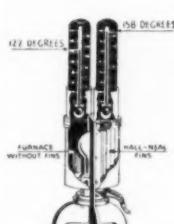
VICTOR FIN Furnaces TAKE YOU OUT OF THE *Competitive Class!*

Heat Radiating

FINS
Save Fuel



Red lines indicate the additional 57½ square feet of heating surface in the 24-inch Victor vs. the ordinary furnace of the same size.



PROOF POSITIVE—
Table top thermometer demonstrator proves the effectiveness of Victor Fins in actual degrees of extra heat delivered.

No Other Furnace
has ALL of these

EXCLUSIVE SALES FEATURES! More Profit with EASIER SALES...

For 56 years Victor Furnaces forged ahead of competition with exclusive features of built-in quality, operating efficiency and sales appeal. You go after the toughest job with confidence with a Victor.

SURE Fire Sales Closers

- Victor patented, EXTRA HEAT RADIATING "FINS."
- One-piece base ring provides perfect alignment of all parts with 1½" air space under ash pit.
- Welded and riveted boiler plate steel construction, no smoke leaks—CLEAN HEAT.
- Triple Flue Economizer, or radiator, provides longer, more effective fire travel; reduces heat loss in chimney and smoke pipe . . . more usable heat (in Deluxe models).
- Automatic Damper Control in radiator provides direct draft when feed door is open, closes automatically when door is shut.

FURNACES • OIL BURNERS • STOKERS • GAS BURNERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE Co.

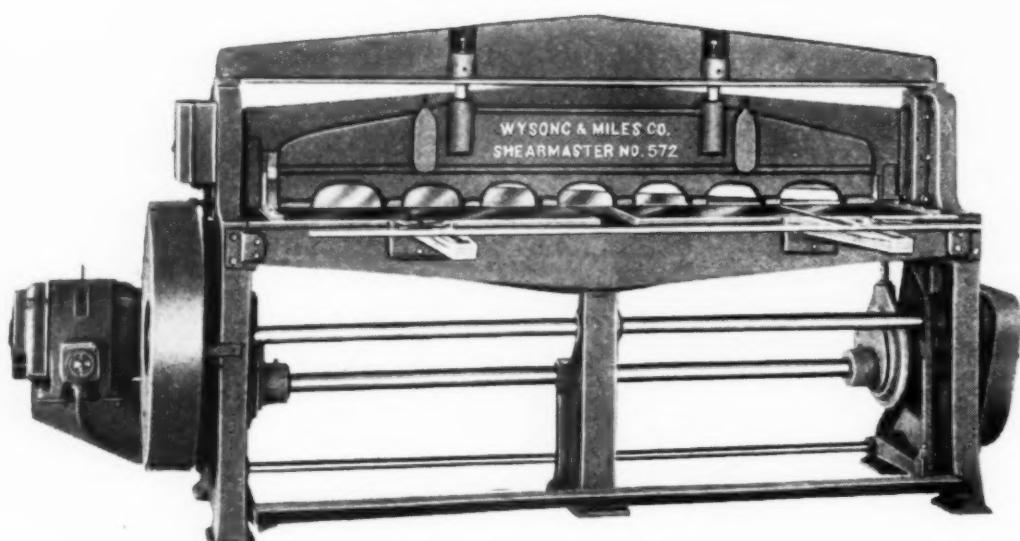
VICTOR Quality Furnaces Since 1890

1322 N. CAPITOL AVENUE • INDIANAPOLIS 7, INDIANA

NO. 572

THE

NEW SHEARMASTER



7

GREAT FEATURES

1. No crawling, twisting or deflection of material
2. Will not mar soft metals
3. Cross shafts can not "whip"
4. New top cross member assures rigidity
5. New gauges add accuracy in positioning material
6. Improved clutch for trouble-free service
7. Holddown springs completely enclosed

Rugged, accurate . . . 14 gauge capacity . . . available in two sizes, No. 552-52" and No. 572-72" . . . the Shearmaster is a modern machine masterpiece. A WYSONG and MILES product. Write for complete description.

WYSONG and MILES CO.

GREENSBORO, NORTH CAROLINA

DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

The Newest Contribution to Warm Air Heating Performance...

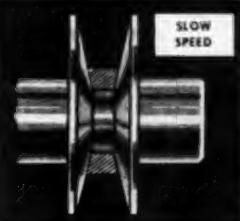
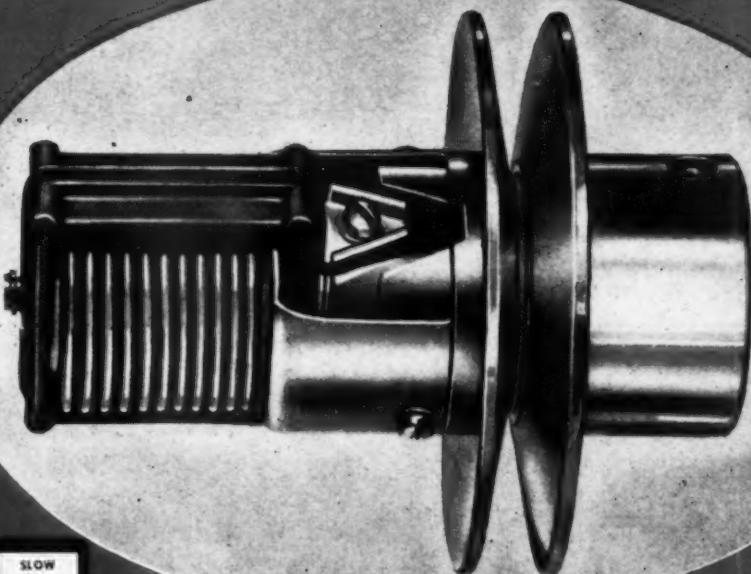
WEBSTER ELECTRIC

Thermodrive

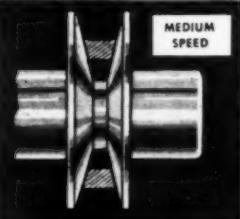
A NEW PRINCIPLE...

SIMPLE...EFFECTIVE...

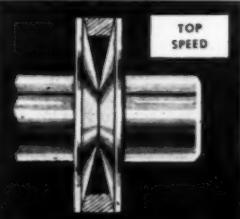
REGULATES WARM AIR FLOW



Bonnet temperature 90°. Belt rides on low-speed position, driving fan slowly.



Bonnet temperature 110°. Belt rides on mid-speed position, driving fan faster.



Bonnet temperature 135°. Belt rides on high-speed position, fan at full speed.

Thermodrive Brings a NEW Measure of Comfort to Those Who Heat with Warm Air

Thermodrive is that advance step you'll want to incorporate in new equipment, or recommend for installation by those who already have warm air heat. It is already acclaimed by manufacturers, distributors, dealers, and consumers alike as a major contribution to warm air heating performance.

Thermodrive is designed to regulate fan speed in a forced warm air heating system so as to give more even room temperatures, along with more economical heating performance. It automatically increases fan speed as bonnet temperature increases, and decreases it as the bonnet cools. From low to high speed increases can be as much as 50%.

It is mounted on the blower motor shaft in place of the usual drive pulley. A "sample" of warm air is continuously taken from the

bonnet and discharged over a thermostatic bellows, which in turn actuates a sliding sheave. This changes the pulley's effective diameter and results in either increased or decreased speed of the fan.

The market for this new item is far-reaching, as every owner of a warm air heating plant is a prospect. For the dealer, it is an item of year-round sales value. Original equipment manufacturers will want to incorporate Thermodrive as a modern element in their latest designs.

Years of experience gained in making fuel units and ignition transformers for the heating field are responsible for this latest Webster Electric development in the control of warm air heat.

For full information on prices and availability, write Webster Electric Company, Racine, Wisconsin.

WEBSTER
RACINE



ELECTRIC
WISCONSIN

Export Dept., 13 E. 40th Street, New York (16), N. Y. Cable Address "ARIAZ" New York City

"Where Quality is a Responsibility and Fair Dealing an Obligation"



PHILLIPS, GETSCHOW CO. OF CHICAGO

Installed Herman Nelson

Harlich Manufacturing Co., Homan and Diversey Avenues, Chicago
A. Epstein, Engineer, Chicago.

Wesco Construction Co., Contractor, Chicago.

Phillips, Getschow Co., Heating Contractor, Chicago.



Roy M. Getschow, President
Phillips, Getschow Co.

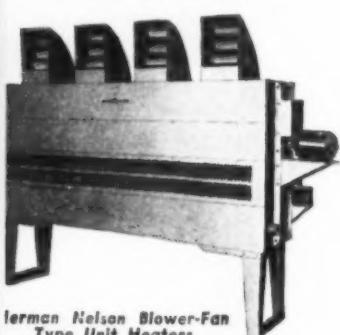
FIFTY-SEVEN Herman Nelson Unit Heaters have recently been installed in the modern, million-dollar plant of the Harlich Manufacturing Co. in Chicago. This is a typical example of the many outstanding buildings of all types for which Herman Nelson Products have been selected to provide superior heating and ventilating results.



Herman Nelson Propeller-Fan
Type Unit Heaters

Today — as during the past 40 years — Herman Nelson Equipment is the first choice of leading Contractors, Architects and Engineers all over America. This is a natural result — not because of any claims on our part — but because Herman Nelson Products have proved themselves superior through actual on-the-job service. Performance records stand behind the statement, "You can't buy better heating and ventilating equipment than that bearing the Herman Nelson nameplate."

For assistance in the solution or simplification of any heating or ventilating problem, call on the nearest Herman Nelson Distributor or Product Application Engineer listed on the next page. You'll find him not only anxious to be of service, but also thoroughly qualified to provide practical as well as technical advice on your next job.



Herman Nelson Blower-Fan
Type Unit Heaters



THE HERMAN NELSON CORPORATION

for 40 years manufacturers of quality heating and ventilating products

MOLINE, ILLINOIS

Unit Heaters in This Factory

Herman Nelson Branch Offices

Boston—W. N. Murray, Mgr., J. F. Flannery, Product Application Engineer.
 Chicago—C. A. Pickett, Mgr., J. C. Donaldson, Herman Stai, R. C. Taylor, Product Application Engineers.
 Cincinnati—W. J. Killian, Product Application Engineer.
 Cleveland—Frank B. Johnston, Jr., Product Application Engineer.
 Detroit—M. E. Van Vliet, Mgr.
 Milwaukee—Carl Amundson, Product Application Engineer.
 Minneapolis—Homer Melvin Bird, Product Application Engineer.

Moline—Anthony Spoodis, Mgr.
 New York—Charles E. Wandas, Product Application Engineer.
 Philadelphia—P. A. Cavanagh, Mgr., C. R. Anderson, Product Application Engineer.
 Pittsburgh—G. M. Heslop, Product Application Engineer.
 St. Louis—Henry C. Sharp, Mgr., E. Paul Harder, Product Application Engineer.
 Syracuse—Lawrence C. Ward, Product Application Engineer.
 Washington, D.C.—J. M. Osborne, Product Application Engineer.

Herman Nelson Product Application Engineers

Albuquerque, N. M.—Boyd Engineering Co., Ltd.
 Atlanta, Ga.—Felix J. Commagere
 Birmingham, Ala.—Hugh C. Boisclair
 Buffalo, N. Y.—Edward H. Cox
 Cape Elizabeth, Me.—The Partridge Co.
 Charlotte, N. C.—Charles M. Setzer & Co.
 Columbus, O.—Russell H. Smith Equipment Co.
 Dallas, Tex.—W. E. Lewis & Co.
 Denver, Colo.—Fox Metal Products Corp.
 Des Moines, Iowa—Products, Inc.
 Duluth, Minn.—Williams-Swanson Co.
 El Paso, Tex.—Boyd Engineering Co., Ltd.
 Grand Rapids, Mich.—O. D. Marshall
 Houston, Tex.—D. R. Rippey
 Indianapolis, Ind.—George Heidenreich
 Jackson, Miss.—H. M. Ludlow
 Kansas City, Mo.—H. H. Wright Company
 Louisville, Ky.—John Zimmerman

Los Angeles, Calif.—F. J. Hearty & Co.
 Memphis, Tenn.—Southern Sales Co.
 Miami, Fla.—R. P. Keiley
 Minneapolis, Minn.—P. R. Reese
 Missoula, Mont.—W. M. Walterskirchen Co.
 Nashville, Tenn.—Southern Sales Co.
 New Orleans, La.—Cressy Sales Co.
 Oklahoma City, Okla.—O. T. Carroll
 Omaha, Neb.—Verna Simmonds
 Portland, Ore.—T. C. Langdon & Co.
 Richmond, Va.—W. Wallace Neale
 Saginaw, Mich.—W. A. Witheridge Co.
 Salt Lake City, Utah—Midgley-Huber
 San Antonio, Tex.—Harry J. Dalton
 San Francisco, Calif.—E. G. Cooley Co.
 Seattle, Wash.—E. H. Langdon Co.
 Spokane, Wash.—R. L. Nelson

Herman Nelson Distributors

Babbitt Steam Specialty Co.
 New Bedford, Mass.
 Bailey-Farrell Co.
 Pittsburgh, Pa.
 Baker Specialty & Supply Co., Inc.
 Logansport, Ind.
 E. Best Plbg. & Htg. Supply Co.
 Quincy, Ill.
 W. L. Blake & Co.
 Portland, Me.
 Bond Supply Co.
 Kalamazoo and Battle Creek, Mich.
 J. C. Bowles Co.
 Seattle, Wash.
 J. R. Bradley Co.
 Reno, Nevada
 Brammall Supply Co.
 Benton Harbor, Mich.
 Brock-McVey Co., Inc.
 Lexington, Ky.
 Bruce-Rogers Co.
 Fort Smith, Ark.
 Calcasieu Lumber Co.
 Austin, Tex.
 Canney-Plue, Inc.
 Rutland, Vt.
 Careva Company
 York, Pa.
 Carman-Thompson Co.
 Lewiston, Me.
 W. A. Case & Son Mfg. Co.
 Erie, Pa., and Jamestown, N. Y.
 Cedar Rapids Pump & Supply Co.
 Cedar Rapids, Iowa
 Central Metal & Supply Co.
 Baltimore, Md.
 Consolidated Supply Co., Inc.
 Portland, Ore.
 Cooper Supply Company
 Tulsa, Okla.
 Harry Cooper Supply Co.
 Springfield, Mo.
 Corcoran Supply Co.
 Hyannis, Mass.
 Cordes Supply Co.
 Milwaukee, Wis.
 Cane Co.
 San Bernardino, Calif.
 Dallman Supply Co.
 Sacramento and San Francisco, Calif.
 John B. Davie Co., Inc.
 Rochester, N. Y.
 Disco Corporation
 Wilmington, Del. and Chester, Pa.
 R. B. Dunning & Co.
 Bangor, Me.
 Electric Supply Co.
 Atlanta, Ga.
 Electric Supply Co.
 Galveston, Texas
 Evansville Supply Co.
 Evansville, Ind.
 Evinger Supply Co.
 Burlington, Iowa
 Full Electric Supply Co.
 Elgin, Ill.
 Frederick Trading Co.
 Frederick, Md.

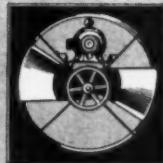
Globe Machinery and Supply Co.
 Des Moines and Cedar Rapids, Ia.
 Griffith Electric Supply Co.
 Trenton, N. J.
 Hajoac Corporation
 Jacksonville and Tampa, Fla.
 Columbus and Savannah, Ga.
 Asheville and Charlotte, N. C.
 Richmond, Norfolk, Roanoke,
 Danville, and Staunton, Va.
 Hall & Knight Hardware Co.
 Lewiston, Me.
 Hansen Supply Co.
 New London, Conn.
 The Hardware & Supply Co.
 Massillon, O.
 Heating Trades Supplies, Inc.
 Toledo, O.
 Hoe Supply Co.
 Christopher, Ill., & Paducah, Ky.
 Holyoke Supply Co., Inc.
 Holyoke, Mass.
 The Hughes Supply Co.
 Mansfield, O.
 Hyman Supply Co.
 Wilmington and Fayetteville, N. C.
 Industrial Supply Co.
 Terre Haute, Ind.
 Industries Distributors, Inc.
 Shreveport, La.
 Industries Sales Corp.
 New Orleans, La.
 Industries Supply Co.
 San Diego, Calif.
 Inland Supply Co.
 Champaign, Danville, Elgin and
 Joliet, Ill.
 Inland-Peoria Supply Co.
 Peoria, Ill.
 International Engr. & Supply Co.
 Providence, R. I.
 J. D. Johnson Co., Inc.
 Poughkeepsie, N. Y.
 E. Keeler Company
 Williamsport, Pa.
 Kester Machinery Co.
 Winston-Salem, High Point and
 Burlington, N. C.
 The W. H. Klefaber Co.
 Dayton and Hamilton, O.
 Knapp Supply Co.
 Muncie, Ind.
 LaCrosse Plumbing Supply Co.
 LaCrosse, Wis.
 Lehigh Valley Supply Co.
 Allentown, Lansdale,
 East Stroudsburg and Easton, Pa.
 LeValley, McLeod, Kinkaid Co., Inc.
 Elmira, Olean, Schenectady, N. Y.
 The Link Company
 Jackson, Mich.
 Luzerne & Lackawanna Supply Co.
 Wilkes-Barre, Pa.
 Manufacturers Selling Co.
 Trenton, N. J.

Marsden & Wasserman, Inc.
 Hartford, Conn.
 Michigan Supply Co.
 Lansing, Mich.
 Chas. Millar & Son Co.
 Utica and Binghamton, N. Y.
 Springfield, Mass., & St. Johnsbury, Vt.
 Missouri Water & Steam Supply Co.
 St. Joseph, Mo.
 Morrison Supply Co.
 Fort Worth, Amarillo, Lubbock,
 Wichita Falls and Sweetwater, Tex.
 Mott Bros. Company
 Rockford, Ill.
 Murphy Supply Co.
 Green Bay, Wis.
 The Ohio State Supply Co.
 Youngstown, O.
 Palmer Plumbing Supply Co.
 Laconia and Rochester, N. H.
 Palmer Supply Co.
 Portland, Me.
 Reading Foundry & Supply Co.
 Reading, Pottsville, and Lebanon, Pa.
 Robbins-Gamwell Corporation
 Pittsfield, Mass.
 The Roekel Company
 Zanesville, O.
 The Salina Supply Co.
 Salina, Kan.
 San Antonio Machine & Supply Co.
 Corpus Christi and Waco, Tex.
 Shore Distributors
 Salisbury, Md.
 Southern Equipment Co.
 San Antonio, Tex.
 Strong, Carlisle & Hammond Co.
 Cleveland, O.
 Tay-Holbrook, Inc.
 Sacramento, San Francisco, Fresno,
 San Jose and Stockton, Calif.
 The Tholen Bros. Supply Co.
 Leavenworth, Kan.
 The Topeka Steam Boiler Wks. Co., Inc.
 Topeka, Kan.
 Trimble & Lutz Supply Co.
 Wheeling, W. Va.
 Geo. E. Trudel Co.
 Manchester, N. H.
 U. S. Supply Co.
 Kansas City, Mo., Wichita, Kan.,
 Oklahoma City, Okla.,
 and Omaha, Neb.
 The Universal Supply Co.
 Parkersburg, W. Va.
 J. A. Walsh & Co., Inc.
 Houston, Tex.
 Washburn-Garfield Co.
 Worcester, Mass.
 Western Maryland Supply Co.
 Hagerstown, Md.
 Wigman Company
 Sioux City, Ia.
 Wisconsin River Supply Co.
 Wausau, Wis.
 Yelton-Weaver Supply Co.

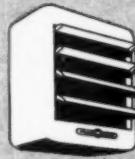
Herman Nelson
Direct Drive
Propeller Fans



Herman Nelson
Belt Drive
Propeller Fans



Herman Nelson
Horizontal Shaft Propeller-Fan Type Unit Heater



Herman Nelson
Type H
Centrifugal Fans



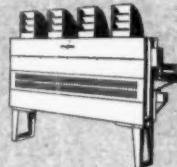
Herman Nelson
Vertical Shaft Propeller-Fan Type Unit Heaters



Herman Nelson
Type HB
Centrifugal Fans



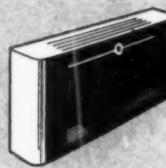
Herman Nelson
Blower-Fan Type
Unit Heaters



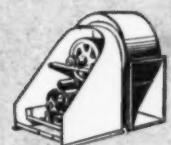
Herman Nelson
De Luxe Unit Heaters



Herman Nelson
Unit Ventilators



Herman Nelson
Belt Drive
Unit Blowers



Herman Nelson
Direct Drive
Unit Blowers



Pipeline CONSUMER ADVERTISING



You THIS WINTER
—Relaxing in the
solid comfort of
FULLY AUTOMATIC
COAL HEAT
supplied by
The Pipeline

Lean back in your easy chair and let the "Original Pocahontas" Pipeline Coal Burner do all your furnace-tending. The Pipeline does everything—it's completely automatic!

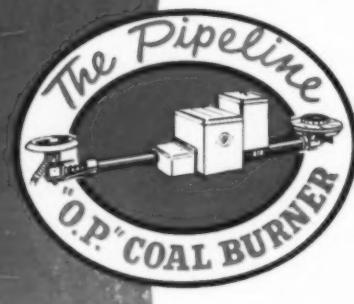
The "O. P." Pipeline silently pipes the coal from your bin to your present furnace—be it hot water, warm air, or steam. The Pipeline also provides smokeless, efficient burning of the most abundant and economical fuel—bituminous coal. It even pipes the ashes to storage in a dustproof container!

Get the details on the coal burner that for 11 years has been supplying the even, healthful heat of coal to thousands of homes. Call your local "O. P." dealer or write for the free booklet, "Pipeline Home Heating." Pocahontas Fuel Company Incorporated, Stoker Division, 338 East 131st Street, Cleveland, Ohio.



The Pipeline
"O.P." COAL BURNER
THE FIRST SUCCESSFUL BITUMINOUS BIN-FED
ASH-REMOVAL COAL BURNER. SUCCESSION TO THE STOKER.

**So automatic it even
REMOVES THE ASHES!**



**REACHING
6,000,000
POTENTIAL
CUSTOMERS
IN**

The American Home
Better Homes & Gardens
Popular Mechanics
Popular Science

Making your selling job easier . . . building greater public demand for *Pipeline* fully automatic coal heat —those are the objectives of this campaign.

Advertisements like the one above are producing inquiries that are passed on to our dealers . . . and lead to sales!

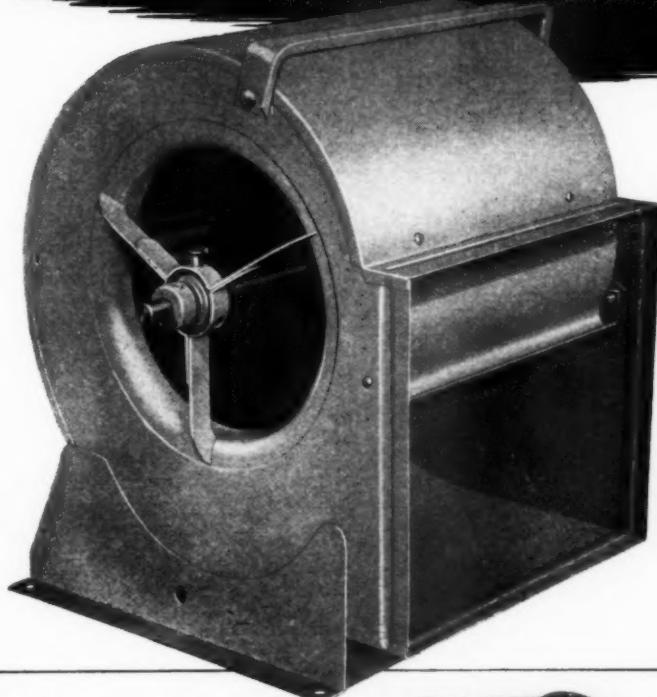
For a profit-making dealership, backed by consumer advertising and effective merchandising aids, sign up with Pocahontas. Write today for detailed information on a *Pipeline* franchise for your territory.



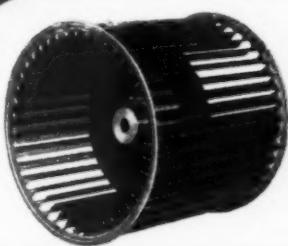
Why Build "Headaches" and Extra Costs?

Snap decisions can be costly, so get all the facts before you decide to build your own blowers. Remember, regardless of claims, only those who build complete blowers know actual costs.

WHY BUILD YOUR OWN BLOWERS?



The LAU Series "A" Center-suspension Blower Wheel is incorporated into the LAU complete assembly. This is the wheel we manufacture in motion for truer concentricity. Matched with the engineered housing it gives greatest efficiency and air delivery performance.



When you can buy the COMPLETE ASSEMBLY from LAU for LESS

Concentrate on Profitable Production. Considering high labor costs, it is easy to see the advantage of utilizing the labor you employ to increase production of your own major product . . . instead of tying up labor on the assembly of blowers.

Do a Bigger Volume with Less Inventory. When you buy complete blower assemblies you can turn over your investment oftener, operate with less storage space and with less loss through waste and damage of materials.

Know and Control Your Costs. In figuring comparative costs, be sure to include *all* cost factors—such as plant overhead, departmental overhead, proportionate sales and advertising expense, depreciation of stock and equipment, maintenance of tools and machinery, correspondence with numerous sources, bookkeeping, and other hidden costs which properly belong on the cost sheets used in pricing the blower that you finally make.

When you buy the COMPLETE ASSEMBLY from LAU, you know in advance what your dollar and cent costs are and can figure them accurately into the total cost of your finished installation.

Profit by Mass Production Economies. LAU has spent, and continues to spend, thousands of dollars in engineering and equipment to produce standardized parts of better quality. Because of mass production facilities and economies, LAU precision-built assemblies offer more definite assurance of mechanical performance and air delivery efficiency.

Let us have a trained representative show you the additional economies in buying complete blower assemblies.



LAU
BLOWER COMPANY
DAYTON 7, OHIO, U.S.A.

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS



1 to 18 wire welds on the same welder!

Wire trays for refrigerators, ovens, kitchen cabinet shelves and many other uses are being produced *at the rate of 2,000 per hour* at the modern plant of the L. A. Young Spring and Wire Corp., Detroit.

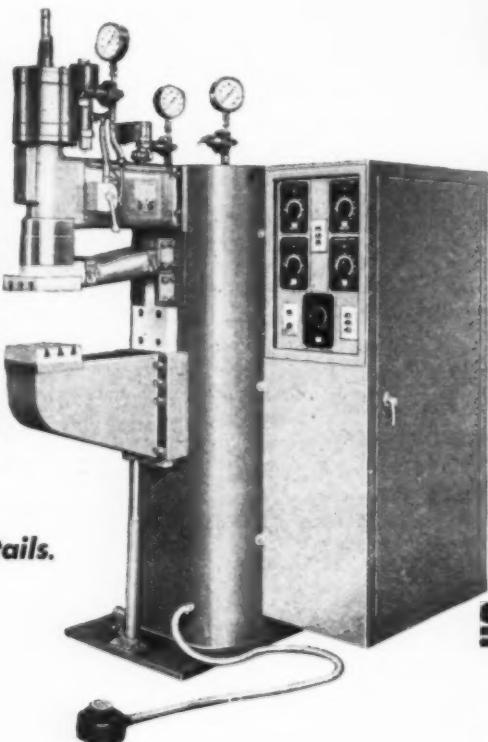
A recent installation of 14 Sciaky 250 KVA projection welders helps maintain this impressive production record. An outstanding characteristic of these machines is *flexibility* . . . the same welder can accommodate many jobs with only a simple change in dies and settings.

If your problem involves joining wire in one or many operations, it will pay you to investigate this rugged, versatile welder. Ask for a SCIAKY application engineer.

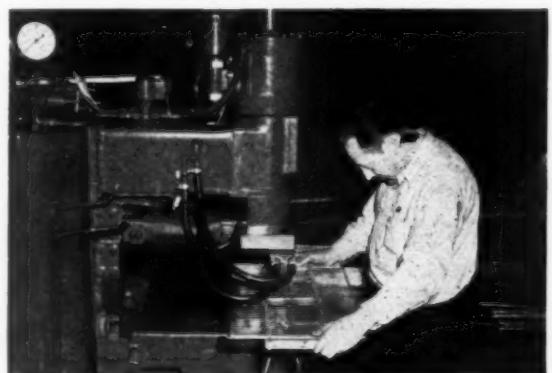
Specially Designed for use in the Wire Industry

This projection welder (type PMCO 1-250-18) is rated 250 KVA at 50% duty cycle. Capacity is from two 1/16" basic steel wires up to and including eighteen 11-gauge wires. Stepless heat adjustment is provided by both tap switch and phase shift. Complete electronic controls insure balanced circuit, cleaner, faster welds.

**Write for
Complete Details.**



3 simultaneous spots weld .050" channel to .225" wire frame on these refrigerator trays.



9 cross wires of .092" stock are welded to an .307" trim section in one operation.



Handles are welded to refrigerator tray with two simultaneous spots. (Majority of material is 18-8 stainless steel.)

**SCIAKY BROS.
Inc.**

4905 W. 67th St.

Chicago 38, Ill.

THE
WILLIAMSON
HEATER COMPANY

what does this name mean?

The name Williamson stands for Better Living through Better Heating.

That is the foundation upon which Williamson success and the permanently profitable business of Williamson Distributors and Dealers has been built through the years.

Founded in 1890 Williamson has ever placed the emphasis on quality and workmanship in the product and a properly engineered heating layout and installation. When you sell Williamson you promote Better Living.

THE WILLIAMSON HEATER CO. • CINCINNATI 9, OHIO

Good Controls are Vital
 to Gas Burning Equipment
 "DETROIT" V-570 ELECTRIC GAS VALVE

140 VOLT ELECTRIC GAS VALVE
 DETROIT LUBRICATOR COMPANY
 AMERICAN RADIATOR & STANDARD SANITARY
 VOLTAGE 115 VOLTS 60 CYCLES

NOTE THESE FEATURES—

STEP OPENING ACTION

—The V-570 provides partial opening on initial operation. This means quiet ignition. Draft is established prior to gradual increase in gas flow, eliminating noise and surging.

QUIET OPERATION—No click or hum.

POSITIVE CLOSING

COMPACT—ATTRACTIVE

HEAT MOTOR OPERATED—LOW VOLTAGE—Easy installation

RUGGED DESIGN—Simple and serviceable—easily opened for cleaning.

SNAP ACTION on opening and closing

This valve on any gas burning equipment means it has the best; a valve that will give satisfaction for the life of the equipment. "Detroit" V-572 Gas Valve is identical with V-570, except that the step opening feature is omitted.

DETROIT LUBRICATOR COMPANY General Offices: 5900 TRUMBULL AVENUE
 DETROIT 8, MICHIGAN



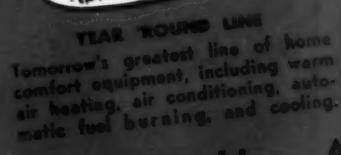
"DETROIT"

Division of **AMERICAN RADIATOR & Standard Sanitary CORPORATION**

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

How Much can a Manufacturer Do to Insure a Prosperous Future For The Independent Furnace Dealer?



YEAR ROUND LINE
Tomorrow's greatest line of home comfort equipment, including warm air heating, air conditioning, automatic fuel burning, and cooling.



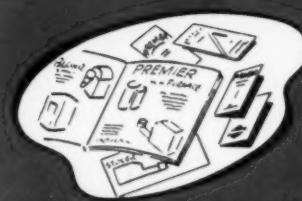
EXCLUSIVE FRANCHISE
Full territory protection that safeguards the dealer against unfair competition, and insures his future profits.



FACTORY PLAN SERVICE
Complete, factory-drawn plans prepared by heating engineers with long experience, to speed up installation and create satisfied customers.



FIELD ENGINEERING SERVICE
Factory-trained experts, to go out on the job with you, to plan special installations, close important sales, etc.



SALES and ADVERTISING SERVICE
A wealth of new advertising and selling material, prepared by merchandising specialists, to help you get new business.



TIME PAYMENT PLAN
A factory financing plan that enables you to sell on installments, yet get your money in full when you close the deal.

In the months ahead, PREMIER is going to prove how much a manufacturer can do to promote the Independent Furnace Dealer's success.



PREMIER merchandising and engineering specialists are now completing development of the greatest program of dealer cooperation that we've ever offered. Under this program, PREMIER specialists with lifetime experience in this business are going to work shoulder to shoulder with the dealer, in solving tomorrow's problems of

selling, advertising, engineering, financing, etc.

Above are six types of help included in this program. There will be many other forms of dealer cooperation.

With this kind of factory assistance — with the great PREMIER year 'round line — and with exclusive territory protection, certainly the Independent Dealer with the PREMIER Franchise will have every opportunity to become the most successful and prosperous dealer in his locality.

PREMIER

FURNACE COMPANY - Dowagiac, Michigan



It's Here WILSON'S NEW *Spider-Web*



Good news! The famous Wilson "Spider-Web" HAIR Filter Unit, in a NEW, improved, "honeycomb" casing, is now available for users of warm air furnaces and air-conditioning systems everywhere. A smart-looking modern unit. Alive with eye-appeal, clean, practical. So easy to install a woman can do it. Offers users the same highly effective natural hair filtering service as the popular Wilson "Edgeseal" Filters which have made an outstanding record in laboratory tests and in many industrial plants. Gives you the perfect profitable answer to today's huge replacement market—a new, more efficient, economical "throw-away" unit—an air filter leader that guarantees cleaner air, more sales and more repeats.

Some desirable Jobber and Distributor franchises still open. Write at once for complete details, prices and free sample

WILSON & CO., INC.
Air Filter Division
4100 So. Ashland Ave., Chicago, Ill.



WILSON'S *Spider-Web* NATURAL HAIR FILTER

Traps and holds more dust
Makes cleaner air for modern building

ANOTHER NAME FOR DEPENDABILITY IN STEEL

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WEIRCOLOY Galvanized Sheets and Roofing Products • N-A-X Low Alloy Steels • Lacquered and Coated Products
Cold-Rolled Spring Steel • Cold-Rolled Sheets and Strip • Hot-Rolled Sheets and Strip • Structural

WEIRTON STEEL CO.

WEIRTON, W. VA. Sales Offices in Principal Cities

Division of **NATIONAL STEEL CORPORATION** Executive Offices, Pittsburgh, Pa.





no more time for whittlin'

Remember the old days? When a heating dealer worked like a dog about half of his time — then whittled away his days, and his profits, the rest of the year?

Times have changed. VIKING Dealers have no more time for loafing — and losing. They are in the automatic equipment business now. Viking's complete heating, cooling and year-round air conditioning line keeps them busy working and earning, straight through the year. Their men stay with them because jobs are steady. There is profit to be made every month, winter and summer.

Get set for a real boom in cooling and air conditioning. Talk over the details with the Viking Distributor and let him help you plan a busy and profitable future selling and installing VIKING'S year round line.

THE VIKING MFG. CORPORATION

1747 Chester Ave.

Cleveland 14, Ohio

use the coupon —

Send for the name of the VIKING Distributor nearest you.
He'll waste no time getting over to see you.

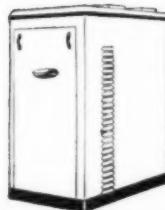
The Viking Mfg. Corp.
1747 Chester Ave., Cleveland 14, Ohio.

We want to talk to the VIKING Distributor about cooling and air-conditioning.

Firm Name _____

Street Address _____ City _____

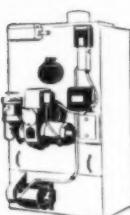
Signed by _____



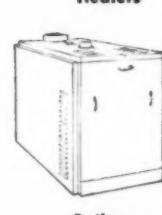
**Oil and Gas
Furnaces**



**Water
Heaters**



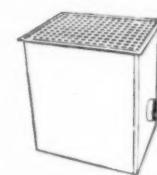
**Utility Room
Furnaces**



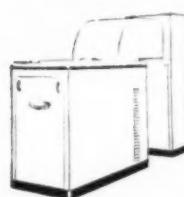
Boilers



Space Heaters



Floor Furnaces



**Year-Round Air
Conditioners**



**Conversion
Burners**



Room Coolers



**Coal
Furnaces**



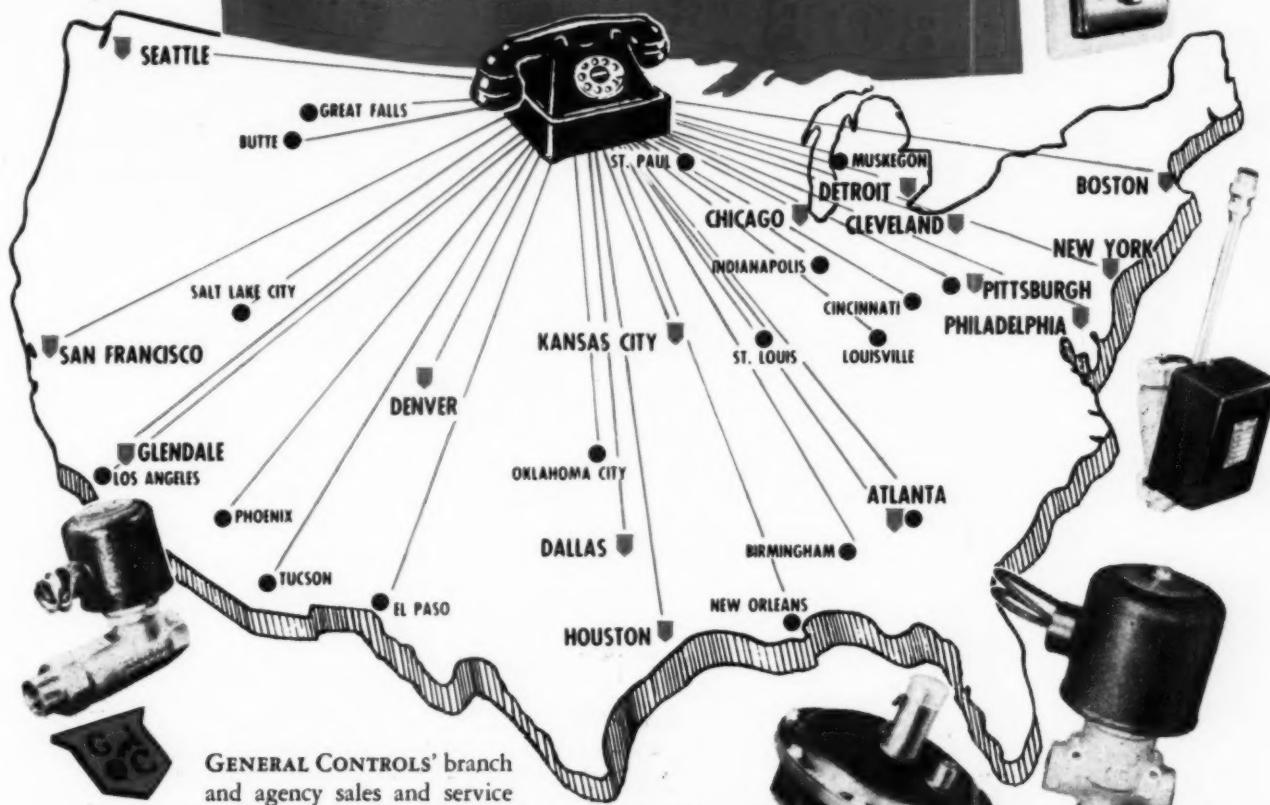
Domestic Stokers

**The VIKING Complete
line of Heating, Cooling and
Year-Round Air Conditioning
Equipment — Fuel-Oil, Gas
or Coal-Fired.**



32 Talking Points

FOR GENERAL CONTROLS SERVICE
WHERE AND WHEN YOU WANT IT



GENERAL CONTROLS' branch and agency sales and service offices are located in principal cities. Their adequate facilities, the experience and skilled counsel of their personnel are as conveniently near to you as your telephone.

Of equal importance—when you are considering automatic temperature, pressure and flow controls—is that General Controls are good products, engineered right, built right, proved by performance. We are in the automatic controls business. Our business is controls and thousands will tell you that we know our business.

There are talking points about General Controls' engineering and field service that should benefit you...as they are benefiting others in your line of business. A wire, letter or telephone call (see yellow classified section of principal city telephone directories) will bring a qualified Controls Engineer to your office.

FOR COMPLETE SPECIFICATIONS request new Catalog and Service and Instruction Manuals.

36-1

GENERAL
801 ALLEN AVENUE

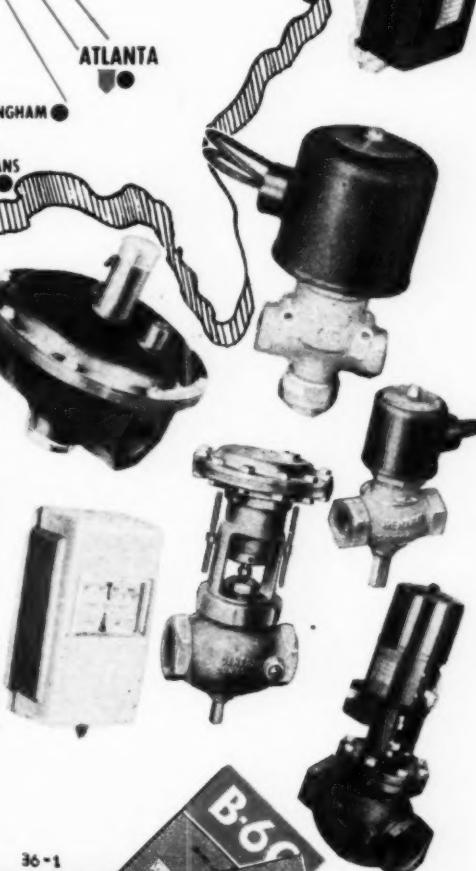


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BLINDALE 1, CALIF.

Manufacturers of Automatic, Pressure, Temperature & Flow Controls

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
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full of valuable data

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Mayn Air Damper
in stackhead
eliminates Dampers
in basement
ducts.

MAYN AIR STACK HEAD DAMPERS

- (1) Install with 3 sheet metal screws.
- (2) Lock automatically when proper adjustment is obtained.
- (3) Save money 3 ways—cost of damper; cost of installing; cost of balancing, which is a one-man job.

MONCRIEF SUREFIT FITTINGS

The Complete line that saves Time—
Cuts installation costs—Increases Profits



A complete NEW MONCRIEF Line The Finest Automatic Heating and Air Conditioning Units - Gas - Oil - Coal



Series L
Gas-Fired, Steel
Air Conditioning
Unit



Series W
Gas-Fired, Steel
Gravity Furnace



Series U
Gas-Fired, Steel
Utility Air Con-
ditioning Unit



Series 6000
Oil-Fired, Steel
Air Conditioning
Unit



Series AC-700
Gas-Fired, Steel
Air Con d. en. g
Unit



Series 700
Coal-Fired, Steel
Gravity Furnace



Series C
Coal-Fired, Cast
Gravity Furnace

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF
SINCE 1895

FURNACE PIPE AND FITTINGS

Extra Copper Plus Molybdenum Makes Toncan Iron



Fight Rust

Partners who complement each other are successful. That's why Toncan Iron is able to win its fight against rust. This material is a partnership of open-hearth iron, copper and molybdenum.

In Toncan Iron, advantage is taken of the qualities offered by each of these elements. To highly refined open-hearth iron, which is remarkably free of rust-inviting impurities, is added twice as much copper as found in copper-bearing steel. Molybdenum is used to develop the maximum rust-resistance of the copper. That combination is the reason Toncan Iron has the highest rust-resistance of any ferrous material in its price class. And it's the reason Toncan Iron is completely rust-resistant throughout its entire cross-section.

But that's not the whole story. Toncan Iron has excellent workability. It's easy to cold work, cut, bend, punch, stamp, etc.

Improve the competitive position of your sheet metal products by using the winning combination of rust-resistance and ease of fabrication offered by Toncan Iron.

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GENERAL OFFICES - CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Use the long life offered by Toncan Iron to build business. Use the excellent fabricating qualities of Toncan Iron to increase profits. For details, write for Booklet 410, "How Toncan Iron Makes Money for Sheet Metal Contractors and Fabricators."

Republic
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MOLYBDENUM **IRON**

Reg. U. S. Pat. Off.

—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, dry walls, beams, and other sheet metal applications requiring rust-resistance.



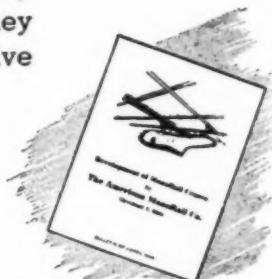
Flexible Handling with MonoRail Cranes



American MonoRail Cranes are not limited to bridging a single span. With their special interlocking and twin bridge designs, they supply over-all coverage . . . your handling is not tied down to alleyways or spotting or unloading near permanent equipment.

American MonoRail Cranes are available for any type of job — heavy or light duty — full automatic, cab controlled or hand operated. They can be installed under present operating conditions without excessive structural changes.

GET A COPY OF THIS BOOKLET! It tells the complete story of monorail crane development. Learn how cranes have been adapted to all kinds of handling operations. Ask for Bulletin MF-1.



THE AMERICAN **MONORAIL** COMPANY

13133 ATHENS AVENUE

CLEVELAND 7, OHIO

CHECK THE FACTS and you'll find . . .

Engineering Leadership

IS ANOTHER REASON WHY
OIL-O-MATIC
LEADS THE WORLD IN SALES



SALES LEADERSHIP cannot be won and held simply by engineering the coal shovel out of the basement. That's why Oil-O-Matic is constantly "engineering against engineering" to build an oil burner that is always better than any on the market today—even an Oil-O-Matic!

For example, in spite of countless advantages, the Low Pressure Principle poses an engineering challenge that 99% of oil burner manufacturers have sidestepped. Yet Oil-O-Matic engineering created the Thrift Meter, Lo-Pressure rotor, Flame Stabilizer, and Oil-Air Nozzle . . . features that make the Low Pressure Principle in the Oil-O-Matic system the most highly developed and

highly perfected in the oil heating world.

Part-time engineering didn't do this. In fact, a fully-manned research and engineering staff has always been part of Oil-O-Matic's program. Today, Oil-O-Matic's Engineering and Research Division, many times greater in size, personnel and scope, is creating new equipment to put the new Oil-O-Matics even further in advance of the field.

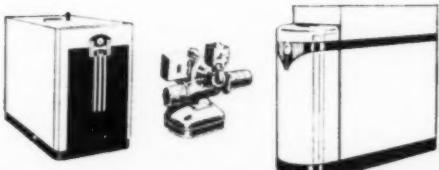
In addition, Oil-O-Matic leads in . . .

DESIGN—Because it is designed to operate on the famous Low Pressure Principle, wherein air and oil are mixed inside the burner, Oil-O-Matic handles any type and grade of fuel oil without clogging, and gives unequalled efficiency, economy, and dependability.

MANUFACTURING—The manufacturing facilities and know-how that made Oil-O-Matic the leader . . . that resulted in a \$20,000,000-a-year war production rate . . . are now devoted to a still greater volume of precision-built peacetime products.

SERVICE TRAINING—Oil-O-Matic was first in the industry with a complete installation and service program. Today, Oil-O-Matic's Service School is turning out thoroughly trained oil heat specialists at the rate of 1,000 a year.

MERCHANDISING—Over \$5,000,000 already spent in advertising and promotion has made Oil-O-Matic first in sales and first in public choice. Powerful magazine and newspaper ads, plus dealer helps, are daily selling more Oil-O-Matics—and keeping them sold!



WILLIAMS OIL-O-MATIC DIVISION, Eureka Williams Corporation, BLOOMINGTON, ILLINOIS

Luxaire's 1946 GAS FIRED UNITS

MORE BEAUTY!
MORE SELLING FEATURES!
MORE PERFORMANCE!

- Luxaire's 1946 line gives you everything you need to meet the demands of the heating market. Outward beauty is combined with advanced, automatic heating features—all approved by The American Gas Association—to answer America's demand for clean, economical automatic gas heat. You can profit with Luxaire.



Series 8000
Oil-Fired, Steel
Air Conditioning
Unit



Series AC-700
Coal-Fired, Steel
Air Conditioning
Unit



Series 700
Coal-Fired, Steel
Gravity Furnace



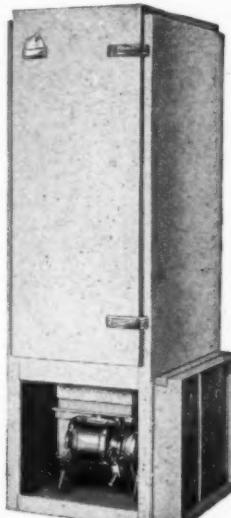
Series C
Coal-Fired, Cast
Gravity Furnace



Series A
Gas-Fired Steel Air
Conditioning Unit



Series G
Gas-Fired, Steel
Gravity Furnace



Series H
Gas-Fired, Utility Steel Air
Conditioning Unit

THE C. A. OLSEN MFG. CO. - ELYRIA, OHIO

Luxaire



HEATING & AIR CONDITIONING UNITS



You can't blame
the ladies
for loving Stainless!

In kitchen sinks and table tops, in pots and pans, in cooking utensils and household gadgets of all kinds, its beauty, cleanliness and long-time economy are so outstanding that Stainless Steel has endeared itself to feminine hearts.

Neither are men immune to the appeal of Stainless. They've watched Stainless Steel equipment stand up under all sorts of severe service—and they're sold on Stainless because it's the one metal that can really "take it."

Why not cash in on this popular preference for Stainless Steel? Set yourself up as a Stainless Steel specialist, and go after the countless, profitable jobs in Stainless that eager buyers are impatiently waiting for.



REMEMBER THIS. Working with U-S-S Stainless Steel is not difficult — it's just different. Our new book, "Fabrication of U-S-S Stainless and Heat Resisting Steels", explains those differences clearly — will help you avoid common errors in working with Stainless—is a practical, authoritative guide that will speed up your work and insure the best results at lowest cost. Send for it—it's free.

U-S-S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago and New York

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco

NATIONAL TUBE COMPANY, Pittsburgh

TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

United States Steel Supply Company, Chicago, Warehouse Distributors

United States Steel Export Company, New York



UNITED STATES STEEL

Which Man will make the best oil burner salesman?

Can you pick him—and be sure?

Timken Dealers won't have to use *guess-and-hope* methods when the day comes that they need to hire new salesmen.

Then—using a scientific Timken Salesman Selection Method—they will be able to determine *before they hire a man* whether he has the aptitudes and abilities of a good burner salesman—whether an investment of time and money in training him will be worthwhile.

Results? More *good* salesmen! A higher ratio of sales closed to sales lost! A lower unit sales cost! An organization in which every man is fitted for the job and *thoroughly* trained because the dealer knew his time wouldn't be wasted.

The new Timken Retail Salesman Selection Program, recently introduced, is still another Timken "first"—still another reason why the Timken

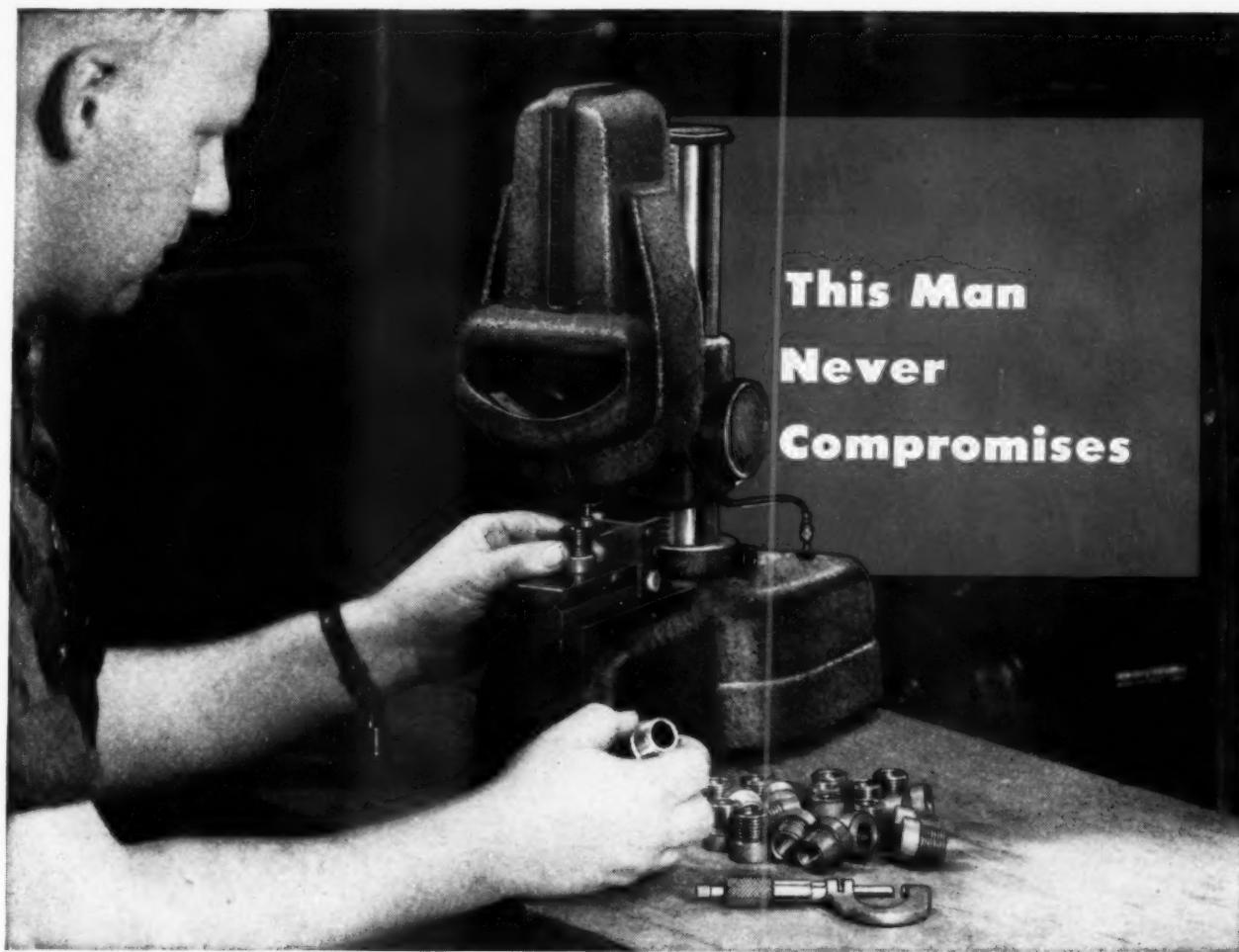
Dealership Franchise is the most sought-after franchise in the oil heating industry.

The right products. The right ways to advertise and sell them. The right selection, training and supervisory methods. The right field co-operation. Everything you need to sell more equipment—to make more money—against any competition!

TIMKEN
Silent Automatic
HEAT

TIMKEN SILENT AUTOMATIC DIVISION
THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICH.





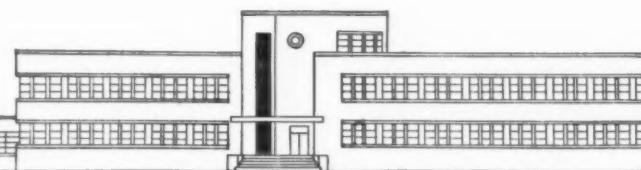
**This Man
Never
Compromises**

He knows your business depends on satisfied customers. So, this PENN inspector, like every other PENN expert in our modern factory, wants to give you *the best automatic heating controls he can build.*

Here, he employs a visual gauge to check carefully the critical dimensions of a screw machine part used in PENN Controls. Even the slightest deviation from the rigid specifications is cause for rejection.

You can assure your customers of this extra value. For, *PENN Controls cost no more*—and they are built for every heating job—every type of heating system. Ask your jobber about the complete PENN line. *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U. S. A. In Canada: Penn Controls, Ltd., Toronto, Ontario.

PENN

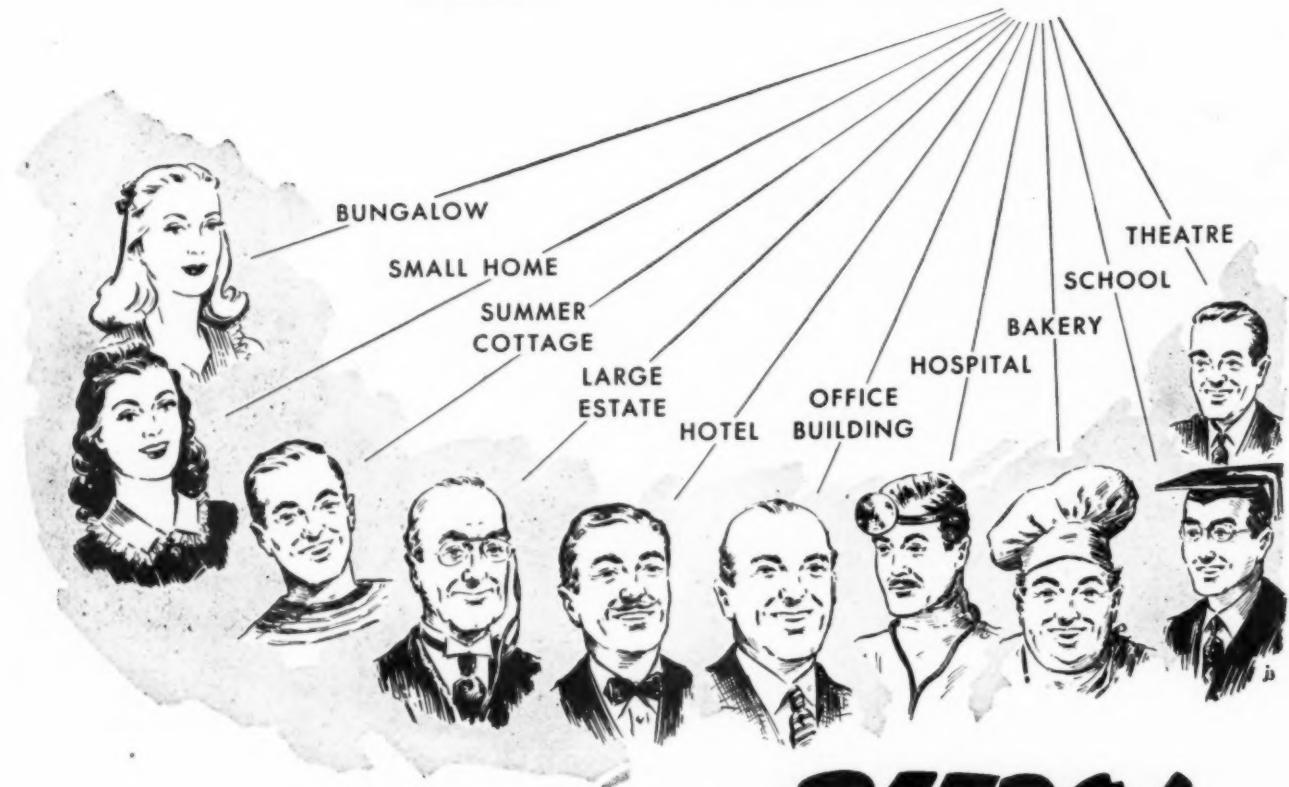


AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

WHEN THEY ASK YOU...

"what oil burner for my ▲?"



... your **best** answer is **PETRO!**

In Petro you have a *complete* line of oil burning equipment. This means you can go after *all* burner business right across the board.

Petro Oil Burners come in pressure atomizing models handling from 1 to 18 gal. per hr. of domestic fuel oils as well as rotary cup

models handling from 11 to 145 gal. per hr. of heavy commercial-industrial oils.

* * *

Petro Burners are distributed by leading wholesalers of heating supplies; there's one near you.

PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT

PETRO FUEL OIL BULK PLANTS, DISTRIBUTION TERMINALS AND FACILITIES IN: BOSTON • PROVIDENCE • STAMFORD
MT. VERNON • NEW YORK • LONG ISLAND • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO

PETRO
REG. U.S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT
SINCE 1903

SHEET METAL WORKERS SAY———

Everybody in town's a Potential Customer

"Nobody knows *all* the things you can sell Wheeling Expanded Metal for," says one sheet metal man.

We agree. Every time we make up a so-called "complete list" of uses, somebody springs a few new ones . . .

—Like the guys that discovered it made perfect stall partitions for race horses.

—And the guy who uses it for bird proofing ventilators.

But you don't have to think up new ones. There's plenty of profitable business in door, window and transom guards,

ventilation grilles, tree guards, machine guards, ventilating partitions in apartment house basements, radiator covers, blower grilles, screen door guards, barn and silo rat proofing, animal pens, vegetable bins for stores, sanitary shelving, lockers, fences, and so on.

Light and strong, with many fittings available, it's easy to make up.

Note: Send for illustrative literature.

Maybe some of the stores in your town could use some Wheeling Expanded Metal display racks. Thousands of stores use them. Why not find out—it may lead to a lot of profitable business.



WHEELING CORRUGATING COMPANY WHEELING, WEST VIRGINIA

ATLANTA
BOSTON
BUFFALO
CHICAGO

CLEVELAND
COLUMBUS
DETROIT
KANSAS CITY

LOUISVILLE
MINNEAPOLIS
NEW ORLEANS
NEW YORK

PHILADELPHIA
PITTSBURGH
RICHMOND
ST. LOUIS

ALLIED BUILDING } CREDITS, INC. }

Announces:

To make the homes you build for G.I.'s as attractive financially as they are pleasing to the eye, Allied Building Credits, Inc., has devised the G.I. Home Security Plan. Its function—to tide the G.I. home-owner's family safely over the critical period of uncertainty which follows, should the home owner die. During this time, the G.I. Home Security Plan guarantees to the home buyer that mortgage payments will be made for the family.

How Does This Plan Benefit Builders?

National interest is concentrated on the veteran's welfare, and with 90% of all new housing for veterans, this new ABC plan is indeed timely. A service that fits exactly the great G.I. market, the G.I. Home Security Plan will gain much favorable and invaluable word of mouth advertising for you—it will increase many times your most important intangible asset: good will.

Certainly worthwhile, certain to find eager acceptance by home buyers, this new exclusive Allied Building Credits plan provides security on a basis and at a cost obtainable nowhere by the mortgagor as an individual. *The protection afforded, in most cases, costs only a few cents a month.*

Who Is Eligible Under This Plan?

The G.I. Home Security Plan was

• A UNIQUE SERVICE FOR
PROJECT DEVELOPMENTS

The G.I. Home Security Plan



especially designed to benefit World War II veterans under fifty-five years of age who are purchasers of new homes.

What Are the Provisions?

In the event of death from any cause, the proceeds of the coverage will be credited to the account of the mortgagor. The amount of coverage is decided upon by the home builder, and is uniform for each home in the project. There are seven different schedules of coverage to choose from.

(Those home buyers who wish to have the entire unpaid balance of the mortgage cancelled if the mortgagor dies may supplement the G.I. Home Security Plan coverage with that of ABC's Mortgage Cancellation Plan.)

What Are the Terms?

No medical examination is necessary. Veterans who buy a home in a development covered by this service are automatically protected.

What Do Builders Think of It?

Outstanding home builders throughout the country have enthusiastically approved the G.I. Home Security Plan. Many feel that since the benefits are so great for such a low price, they will pay the costs themselves.

• WRITE FOR COMPLETE INFORMATION on how you can make the G.I. Home Security Plan available to your buyers. You will find it extremely practical, extremely simple in operation. Allied Building Credits, Inc., 2504 First National Bank Building, St. Paul 1, Minnesota.

Complete Instalment Note and Mortgage Services for the Building Industry.

ALLIED BUILDING CREDITS, INC.



OFFICES IN
PRINCIPAL
CITIES

Cutting Fabrication Costs with Arc Welding

BY LOUIS WEIGAND, SUPT.
Valley Cornice and Slate Co., Ltd.
Saginaw, Michigan

Practically all of our fabrication, as thin as 18 gauge, is designed for arc welded construction to simplify joint preparation, speed up production and get stronger, neater installations. The majority of our work is galvanized. Here are a few typical jobs:



Fig. 1

In fabricating elbows, we butt weld the longitudinal joints and lap weld the circumferential joints. By tapering the edges, we get a smooth joint with a lap of about $\frac{3}{8}$ ". The elbows shown in Fig. 1 are 14 ga. galvanized, welded with $\frac{1}{8}$ " "Fleetweld 35". This is much faster than riveting and soldering.



Fig. 2

The flour hoppers shown in Fig. 2 are 16 ga. stainless steel. Inlet is 40" x $7\frac{1}{8}$ ". Outlet, 12" diam. Height, 28". All joints are butt welds made with $\frac{1}{8}$ " "Stainweld A5" Electrode.



Fig. 3

The exhaust stack in Fig. 3 shows an interesting use of 14 ga. stainless steel. This stack, 56" long, joins a 43" x 54" breeching to a 54" diam. stack. The only material available was 48" x 120" sheets. By welding in small triangular sections, we made these sheets do. All joints are butt welds, made with "Stainweld A5".



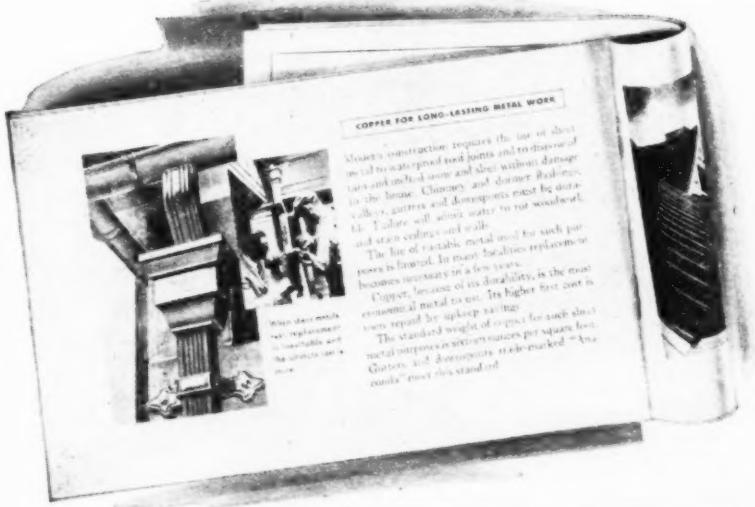
Fig. 4

We do all of our welding with the 150-amp. Lincoln "Shield-Arc Jr." Welder shown in Fig. 4. Here it's being used to butt weld 12 ga. galvanized for 36" sections of 12" diam. pipe.

Full details on the "Shield-Arc Jr." in Bul. 363. Free on request from The Lincoln Electric Company, Dept. 454, Cleveland 1, Ohio.



*Thousands of
Home Builders every month ask for
this book about COPPER...*



ANACONDA
From mine to consumer
Anaconda
COPPER
THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD.,
New Toronto, Ont.

EVERY MONTH thousands of people vitally interested in home building write for the Anaconda booklet illustrated here. They are prompted by Anaconda advertising in leading home magazines—ads which keep reminding them that sheet metal work that lasts (Anaconda Copper, expertly installed) will make any home cost less for upkeep.

Low upkeep costs are more important than ever in these days of higher building costs and material shortages. The owner of a "rust-proofed" home is indeed fortunate. It's a credit to his good judgment, and to the contractor who provided the durable installation.

When you work with Anaconda Copper you're doing the customer a favor he won't forget; also you'll be using the standard of quality in sheet metal, available through supply houses from coast to coast.

Meeting Steel Requirements

the Hard Way—

But Still Meeting Them!

A manufacturer of coal mining drills was desperate for $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{1}{4}$ " square tubing needed for drill supports, on an order scheduled for shipment halfway around the world. The required size of tubing was nowhere available, but Ryerson Steel Service was equal to the occasion.

By forming two channels from $\frac{1}{4}$ " plate and welding the channels together we were able to deliver several hundred pieces of the required tubing! While such an emergency measure is obviously not always practical, it did make it possible for the customer to complete his order and ship on schedule. And this is but one of numerous instances where Ryerson service has achieved the seemingly unachievable.

There are many requirements that we cannot handle today, but it is often surprising what can be done with the close cooperation of your nearby Ryerson plant. If needed steel is out of stock the Ryerson salesman will sometimes be able to suggest a practical alternate steel, or he may know a way in which flame cutting, forming or welding can serve to provide a workable substitute.

So we urge you to keep in touch with us. Our whole organization is doing everything within its power to help every customer get the steel he needs.



JOSEPH T. RYERSON & SON, Inc.,
Steel-Service Plants at: Chicago,
Milwaukee, Detroit, St. Louis, Cincinnati,
Cleveland, Pittsburgh, Philadelphia,
Buffalo, New York, Boston

RYERSON STEEL



Latest Interpretation of "Set Aside" Order

THE latest disturbing order to be released from Washington (mentioned in the editorial in the September issue) is Schedule A (amended) and B of Priority Regulation 33. This is the so-called "set aside" regulation covering certain products and materials required for veteran housing.

Under Schedule B, 75 per cent of all *receipts* of warm air furnaces for new construction must be held by the *distributor*, *indefinitely*, for orders carrying AAA, AA, MM, HH, HHH ratings. Under Schedule A these additional items have now been declared eligible for priority assistance (by manufacturers)—temperature and combustion controls, floor furnaces, domestic oil burners, registers and grilles, domestic stokers, gutters and downspouts and warm air pipe and fittings—but these items do not have to be "set aside" for the moment. *Dealers*, however, must honor HH and other ratings up to 75 per cent of their monthly deliveries of these latter items. Dealers and distributors are not required to hold these items in expectation of receiving rated orders.

In the editorial in the September issue we stated this "set aside" applied to manufacturers. This was not strictly correct. The critical sections of the order read as follows:

"(3) *How the Set-Aside Works.* Out of each shipment received by a distributor of the item listed above, a distributor must set-aside the percentage shown, and deliver those items only on rated orders (including AAA, but not including "certified HH" orders which are placed for FPHA projects under Direction 11 to Priorities Regulation 33). He must not deliver any items set aside on any unrated order, even if he does not have or receive any rated orders, unless he gets permission to do so. He can get this permission by applying to the Regional Housing Expediter, by letter, indicating the number of items he is holding and how long he has held them. The Regional Housing Expediter will release these only when he is unable to arrange for HHH or HH orders to be placed, and usually only where the materials have been held for one month or longer. This changes the rule that used to apply to most of these items permitting them to be sold on unrated orders after

they had been held a certain period of time."

Also paragraph 2 of Section (5)(2) states:

"Where a manufacturer of an item on Schedule A makes some deliveries *directly to users*, those dealers are subject to this schedule and the manufacturer is a *distributor* with respect to them, but the set-aside and ceiling provisions of this schedule do not apply to the rest of the manufacturers' deliveries."

Our interpretation of this is that the manufacturer does not have to set-aside any production excepting such production as the manufacturer sells directly to the user. The user is defined in Schedule B as "a builder, prefabricated house manufacturer, a person who normally installs what he sells such as a plumber, contractor, etc."

Our interpretation is that a manufacturer who sells his complete output to distributors is not liable for compliance with this order, but any product sold by the manufacturer to a user makes it necessary for the manufacturer to set aside for priority orders that part of production which he sells to the user.

There are certain other provisions in this order which the industry will find particularly pestiferous—Section (5) (f) which requires records on "separate sheets of paper" for each material, showing how much was delivered without ratings and how much with ratings for each purchase order placed by him.

It would seem that this order makes the jobber (distributor) a policeman for the construction industry and subject to—"may be prohibited by the CPA from making or obtaining further deliveries of materials and facilities of the kinds listed in paragraph (b) of this schedule."

Also in a surprise move the CPA has ruled that a contractor installing ductwork may use an HH rating to secure flat sheets for furnace pipe and fittings, ductwork and the rating is also extensible for flashings, gutters and downspouts and termite shields. This applies to 26 gauge material and lighter gauges. Copper has also been covered by the rating (flashings, down-spouts and gutters).

FLASH!

Effective October 14, (1) Coal burning furnaces of 2.64 sq. ft. of grate area and larger; (2) oil-fired furnaces of 100,000 Btu output and larger; (3) gas-fired furnaces of 110,000 Btu and larger are exempt from the set-aside provisions of schedule B and may be sold without ratings.

NEWS SUMMARY OF THE MONTH

Priority Help For Heating Items

CPA, on September 12, made CC priority ratings available to producers of several additional plumbing and heating items.

The items added to Schedule I (Critical Products) of Priorities Regulation 28 include: low-pressure boilers for residential heating; furnace pipe, fittings and duct work; registers and grilles for heating systems. The warm air furnaces listing was changed to read: "Furnaces, warm air, including floor and wall furnaces."

The listing on Schedule I makes producers of these items eligible for CC ratings to obtain production materials, capital equipment for replacement only, and maintenance, repair and operating supplies. They are not eligible for CC assistance for construction.

OPA to Survey Jobbers

An industry-wide survey of distributors of plumbing and heating supplies will be undertaken at an early date, announces OPA.

Purpose of the survey is to collect operating and financial data for this trade in order to provide OPA with a basis for working out a mark-up type regulation governing sales of plumbing and heating supplies.

It will be a purpose of the proposed new regulation to preserve the industry mark-ups that were in effect on March 31, 1946 and to make it easier to figure ceiling prices under the proposed regulation than it has been in the past.

OPA accountants will visit a broad group of firms operating in the trade to obtain a representative sample of trade data. All such data will be held in the strictest confidence. OPA also says the survey has no connection whatever with the agency's enforcement activities.

Furnace Production

JULY production of warm air furnaces of all types declined from June, largely because of vacations in the industry. During the first half of 1946, production was 264,000 warm-air furnaces. Requirements for the second half are estimated at 245,000 units for housing and an additional 210,000 for all other uses.

Public Law 679

CONSIDERABLE apprehension has developed in the construction industry over the effect of Public Law 679 which limits to \$175 (single) and \$200 (married) per month the total compensation a veteran may receive from both employer and the government. The new act aroused fear that it would disrupt the apprenticeship programs in the construction industry, but informal assurances have been

given by Veteran Administration officials that the intent of the act is not to interfere with current apprenticeship periods of training in the construction industry and that it will not be so administered. The provision which aroused concern stated that the VA would not approve training that did not require at least three months or which would not be completed in two years.

Asphalt Roofing and Siding

PRODUCTION in July of asphalt roofing and siding amounted to 6,300,000 squares, virtually no change from June. Production is close to the highest level in the industry's history. CPA predicts that total output for this year will approximate 75 million squares, considerably above the peak production of 1942. Continued capacity operations in asphalt roofing and siding plants depend largely on improved production of roofing dry felt.

Presses and Press Brakes

JULY DOLLAR value shipments of mechanical presses, press brakes (and replacement parts) of more than four times the pre-war monthly figure are reported by CPA. Compared with an average monthly shipment rate of \$865,000 in 1939, July shipments were approximately \$3,712,000.

Shipments in August and September are expected to approximate the high July rate.

Backlog of orders, however, remains on an average of 12 to 13 months, with an estimated total value of \$39,000,000.

Heating Trends

A SURVEY of builder and architect plans on heating systems—made by the Institute of Boiler and Radiator Manufacturers—indicates postwar trends toward automatic firing and against gravity systems.

The I-B-R heating trends survey represents a cross-section of the thinking (*Ed. note: the survey does not say what architects or builders were interviewed; this should be necessary to determine if a true cross-section was taken*) of over 750 builders and architects in the territory east of the Mississippi and north of the Ohio River.

A total of 757 personal interviews were made by salesmen employed by manufacturers who are members of the Institute. Of these, 402 were with operative builders; 205 with builders; and 150 were architects.

The answers reflect the types of systems used in over 54,000 houses built in 1940 and indicate the heating plans for over 71,000 homes to be built in 1946.

The results of the survey show that 41 per cent of the houses to be built in 1946 will have hot water or steam systems. This is in contrast to the figure of 28 per cent for 1940, 1941, and 1945.

Significant gains were shown for hot water and steam systems in all areas except the New York Metropolitan area. In this area, including Long Island and New Jersey, there is a trend toward warm air. A slight trend toward warm air is

also shown in the figures for New England and Pennsylvania.

A strong interest in baseboard and panel heating is indicated. A total of 61 per cent of all architects interviewed mentioned baseboard or panel heating.

Oil firing is planned for use in 53 per cent of the homes. This is a reduction from 59 per cent used in 1940.

Gas firing increases from 17 to 38 per cent. Hand firing drops from 23 to 7 per cent.

Factory-Built Homes

PRODUCERS of factory-built homes shipped an estimated 3,000 units during July—about the same number as June—bringing the total for the first 7 months of 1946 to 16,000. There are now 130 plants, in 35 states, which have made shipments sometime in 1946. Some 218 applications for third-quarter priority assistance, covering materials authorizations for about 43,000 homes scheduled for production in that quarter, were approved by August 9.

Many present producers have been unable to maintain continuous operation because of shortages of specific materials. While lumber, flooring, millwork, insulation board, gypsum board and lath, and cast-iron soil pipe are reported most frequently as in short supply, lack of any one of a wide variety of items could shut down production. The factory process is peculiarly vulnerable in this respect. Some 26 firms in production during previous weeks made no shipments for the week ended July 27, and shipments of most other firms have fluctuated from week to week.

Status of Oil Burners

OIL HEAT Institute of America in its Bulletin dated August 23 offers this explanation of the misunderstanding on the priority status of oil burners.

"It has now been verified that there is no general order controlling the sale and delivery of oil burners or oil heating equipment by manufacturers, distributors or dealers and none is contemplated. Here is what *has* happened.

"Under Schedule 1 of Priorities Regulation 28, the Civilian Production Administration listed certain items as critical products in connection with new housing. One of the items put on the critical list was warm air furnaces. This item, and all others on the list, immediately became eligible for priority assistance in obtaining material for production. Furnace manufacturers availed themselves of the opportunity to obtain aid in getting steel. Eventually there were delivered a fairly considerable number of furnace burner units for various of the new housing projects. Oil burners, not being open to priority aid, were not produced as rapidly as they were needed so the furnaces were shipped to the jobs less the burners. The furnaces were installed and since burners were not available to go in the furnaces several thousands of heating systems have been incomplete for a number of weeks owing to the lack of an oil burner.

"Within the past five weeks the furnace manufacturers involved went to the Civilian Production Administration and requested priorities for oil burners to complete these unfinished installations and also for burners to ship with furnaces going forward, at once, for use in other new housing. Since oil burners were needed to complete the furnaces which were all in new housing, CPA granted several furnace manufacturers CC priorities for the burners they required.

"The furnace manufacturers were requested to serve these priority orders on their normal sources of supply and if the orders were so large as to be onerous to a single burner manufacturer the furnace manufacturer was further requested to

split up his order and distribute the production load. That was a request by CPA made at the time of the granting of the priorities.

"Of the several priorities which were granted by CPA, one oil burner manufacturer received the total orders under three of the priorities which resulted in a medium four figure requirement in burners. Since the CC order requires the burner manufacturer to ship all the burners on such order before shipping any unrated burner orders to any other buyer, the result has been that this manufacturer, under present production difficulties, is finding it impossible to take care of the needs of his normal sales outlets.

"Several interesting questions suggest themselves and these have been explored with CPA at Washington. For instance—

"Must a burner manufacturer accept a CC rated order for oil burning equipment? The answer to the question is definitely *yes*, and we refer you to CPA PR-1, dated July 24, 1946, Section 944.2.

"Is there any relief for the manufacturer who feels that compliance with, and acceptance of, rated orders would work an exceptional or unreasonable hardship on him? CPA does not intend that the granting of priorities for oil burners shall result in hardship on any manufacturer. Refer again to PR-1, Section 944.19 under which there is provision for an appeal for relief and the method for the filing and handling of such appeals is described in PR-16.

"Is there any good probability that manufacturers of burners who have not yet received orders, carrying CC priority rating, will receive such orders? It appears that there is a possibility that others will receive priority rated orders. The National Housing Agency has told CPA that they see a need for 40,000 oil burners to be used in the new housing program during 1946. Less than 10,000 of these burners have been given priority ratings and there is the possibility that up to 30,000 more burners may be covered by CC ratings if they are not available as rapidly as needed without ratings.

"Can a burner manufacturer who has priority rated orders obtain priority assistance? CPA states that any manufacturer who has a CC rated order for oil burners may file with CPA a request for priority assistance, if necessary, for motors and transformers to be used only to fill the CC rated order. The request for assistance is to be filed on CPA Form 541-A, Application for Limited Priorities Assistance. *File in duplicate*. The manufacturer should state on the form that he is holding a CC rated order for a stated number of oil burners and give the case number which appears on the CC rated order he has received. The form, when completed, should be forwarded to Morgan Johnston, Chief, Heating Branch, Civilian Production Administration, Room 2-217, Temporary "E" Building, Washington, D. C.

"Is there any possibility that oil burners will be declared a critical product and added to the other items under Schedule 1 of PR-28? NHA may propose that be done. CPA would resist it because they are not interested in giving priority assistance on any item used as a conversion or a maintenance item, generally speaking. Furthermore, they claim they cannot regard a product as critical which, in its several types and sizes (in mechanically operated equipment), has been produced in excess of 187,000 units in the first six months of this calendar year and if produced at the same rate through the rest of the year would result in approximately 375,000 units for the year when the NHA stated requirement for new housing is a maximum of only 40,000 units. CPA prefers to confine priority assistance, if needed, to burner manufacturers who have CC rated orders.

"Any of the regulations or forms referred to in this bulletin, such as PR-1, July 24, 1946, are available from the local office of the CPA covering your district."

Arnold Kruckman's

Washington Letter



Is It Price Or Profit Control?

THE sheet metal contractors of San Francisco have protested OPA Regional Order G-22, RMPR 251, which became effective July 14, 1946, but which was not filed for publication with the official Federal Register in Washington, D. C., until September 13, 1946, and was not actually published until September 18, 1946. It is worth noticing the long gap between the effectiveness of the Order, and its official publication. Legally, a proclamation, or a regulation, presumably, has not been formally given national circulation until published in the Federal Register, issued by the Federal agency of National Archives, "pursuant to the authority contained in the Federal Register Act, approved July 26, 1935 . . . The regulatory material appearing herein is keyed to the Code of Federal Regulations, which is published under 50 titles, pursuant to section 11 of the Federal Register Act, as amended June 19, 1937."

This reporter has neither the time nor the facilities to make the investigation necessary to really develop the meaning of the foregoing quotation. It would involve considerable legal research. It is obvious, however, that the Regional Order G-22 to RMPR 251 is of vital interest to many businessmen besides the sheet metal contractors who actually live in the area to which the Order applies. Doubtless contractors and others living in or closely adjacent to the area were informed of the Order when it happened, although it is not clear how they may be legally advised. There is no doubt, however, that others, at a distance, still do not know what the order says, or what the order actually means. The whole point is labored here because it is part of government practice, particularly OPA practice, which has developed the past eight or ten years, and which irks the businessman and makes him distrust the whole philosophy in government which has permitted such practices to evolve.

G-22 Is a Critical Order

Regional Order G-22, etc., has in it the makings of a collision between the Federal Government and the businessmen which this reporter found so startlingly possible when he visited 15 cities and communities over the length and breadth of this country the past seven weeks. There is no remote doubt in this writer's mind that the feeling of the

entire business community of the nation towards the operation of the Federal agencies today is comparable only to the feeling which existed during the latter days of Prohibition in the majority of the nation towards those whose unhappy job it was to enforce Prohibition.

Regional Order G-22, etc., may well be the showdown so far as the sheet metal industry is concerned, if the contractors have the backbone to fight. This Order, in the simplest terms in which its purposes may be defined, dictates how much profit the contractor may take. *It is called Price-Control, but it is plainly profit-control.* Whether or not any government agent has the authority to tell you how much profit you may take for what you sell, whether materials or services, apparently has not yet been determined by those who interpret the Constitutional meanings of our laws.

There can be no question, on the other hand, that profit-control is more social in its intent than it is economic. It is fair, therefore, to say that an Order such as G-22, etc., has a greater tendency to establish social controls than to provide temporary regulations for price-fixing. In effect such extension of legal powers places the OPA official in the position of saying to the sheet metal contractor that he must be satisfied with this or that exact equation in profits, whether the equation makes him or breaks him. If he doesn't like it he can quit doing business.

And this, we are told, is exactly what is happening in Northern California, where G-22, etc., promulgated by OPA Regional Administrator Ben C. Duniway, is in force. We are told that a number of contractors have quit, either permanently or temporarily, for the reason that you cannot eat and support your family if you do business at a loss. Nor is this experience singular to the sheet metal business. This reporter found people in the leather business, and in several other industries, who virtually found themselves in the same fix by reason of OPA regulations, and who had quit manufacturing or selling until such time as it may be possible to sell at a profit. One businessman in Portland, Oregon, gave the most terse epitomization of the situation. Said he: "This establishment has been in existence over 50 years. When we went into business we adopted as fundamental that nothing would ever go out of these doors which did not bring us a

legitimate profit. And until we can take a legitimate profit nothing will go out of these doors, under existing circumstances."

What G-22 Can Do

It is quite clear that regulations, such as G-22, etc., as well as other OPA regulations, are intended to force upon us the political and economic modifications known by various labels. Some call it Controlled Economy or Planned Economy; others call it Socialization; it also has been called Cooperation. In its extremely ultra-radical phase they call it Communism.

It is possible that the majority of Americans approve the philosophy upon which these practices are founded. But it does not seem probable, when you hear what this reporter has heard during his recent 10,000-mile trip. At least millions upon millions of business people, senior and junior, sharply disagree with such philosophy. They have lost faith in the President, in the Congress, and in the Federal Government agencies, because they think government no longer is responsive to the wishes of those who pay the taxes. They wish smashingly to register their disapproval, but they are not sure that the ballot will have much effect. There is no doubt in this reporter's mind that a huge number of these voters will go to the polls in November and will vote for *persons*, not for party labels. They will attempt to pick out those who seem most competent, realistic, and honest. Parties have lost their meaning. As the average business man sees it, a party at present capitalizes issues to catch votes, not to serve the best interests of the nation.

Candidates Must Declare Themselves

There are indications that in some places businessmen, such as sheet metal contractors, will force the candidates, before the November elections, to declare themselves on issues such as Area Order G-22. These business men obviously realize that if they do not smoke out the candidates *before* the elections they will have small chance of pinning them down later in these days of confusion and bewilderment.

The Regional Order G-22 sets up profit-limits for contractors in Southern California, Northern California, Arizona, Nevada, Oregon and Southern Washington, Western Washington, and Eastern Washington and Northern Idaho. It applies not only to sheet metal and heating services, but also to general contracting services, plumbing services, electrical services, painting and paperhanging services, tile services, brick masonry services, cement and concrete services, lathing and plastering services, and hardwood flooring services.

Sheet metal and heating services are defined as meaning "services rendered in connection with sheet metal and sheet metal fixtures such as gutters, furnaces, ducts, ventilators, and related services. It does not include plumbing services or electrical services."

The order sets forth that the maximum prices established include all expenses, and no additional charge may be made for any cost or incidental service. It has been pointed out that the contractor cannot safely make a bid or an estimate because he is not able to determine his costs until he has finished the job. Yet, under G-22, if he makes an estimate and guesses \$1,200 wrong, he must take the loss, without recourse; while if he guesses \$1,200 high, he must reimburse the customer with the \$1,200 surplus.

The order "provides that for most jobs a seller will determine his maximum price by adding a margin to his costs. For small jobs, a seller will determine his maximum price on a time and material basis. The maximum price shall be the sum of labor costs, material costs, 'other direct costs,' as de-

fined in the order, and the margin provided in the appropriate table, the amount of the margin being dependent on the total of costs. Those in business during March, 1942, shall not exceed the margin used on the most comparable job during the period January, 1939 to March 31, 1942, or the margin in the appropriate table, whichever is lower. No margin may be added to the cost of subcontracts except subcontractors incidental to the main contract."

Other direct costs include only the cost of subcontracts, workmen's compensation insurance, social security tax, unemployment compensation tax, public liability insurance, not exceeding $\frac{1}{2}\%$ of the labor costs on the job; sales tax, building permits and fees, public utility costs borne by the seller, and such other items as listed in the table herewith. Costs do not include administrative expenses, overhead costs, and selling expenses; nor do they include additional allowances permitted elsewhere in this Order; these additional allowances consist of mileage and out-of-town expenses, although a charge may be made therefor, and are not subject to a markup. For small jobs the maximum price shall be the sum of a charge for labor, materials, and other charges permitted by the Order.

Labor and Material "Cost"

"The maximum charge for labor shall be the sum of separate charges determined by multiplying the number of hours of labor performed in each category by the maximum hourly rate applicable." The Order fixes the maximum hourly rate for labor; for the work-time of those who supply only their own skill; for overtime; and it provides the yardstick to measure work-hours.

The sale price of new materials is fixed as the highest price charged by the seller during March, 1942, plus any increases authorized by OPA for sales at retail; used materials or materials which cannot be priced, may be given the maximum of the seller's cost. Only materials actually and necessarily used on the job may be charged to the customer. Work performed on the basis of an estimate may not exceed the estimate more than 15%. Lump-sum contracts apparently constitute their own maximum price, on the basis of the regulations of the Order. Exact and specific rules are laid down to fix mileage expenses, and other out-of-town expenses incurred by the contractor or his employees.

Markups By Area

In Northern California transactions over \$100 and under \$500 are permitted mark-ups of 25% on materials, and "direct cost." On jobs over \$500, either repairs or new work, the mark-up is 20%, or \$175, whichever is highest. Under \$100, the permitted charge is \$3 an hour, or 170% of the journeyman's wage rate. In some areas the charge permitted is \$2.75, or 170%, whichever is lowest, in relation to the journeyman. Apprentices are estimated at 150% of the hourly wage; materials are permitted 35% mark-up.

In Oregon and Southern Washington, the "break-off," is set at \$150, below which the basis of computation is \$2.50 an hour for a journeyman's wage, or 170% of the hourly wage. Under \$500 the mark-up is 30%; over \$500, 25% or \$150. The minimum charge has been placed at \$2.50, and the maximum at 50%. Gutters, downspouts, etc., are listed at mark-ups of 12c, 13c, 14c, etc. Lump sum jobs are permitted an additional 5%, based on the total cost, but not including mileage, which is set at 5c per mile. The Order is directly administered in the Area, at San Francisco; any

(Continued on Page 110)

Sales Prospect - Handle With Care!

By J. ARCHER KISS

IT is a well known fact that science is always ahead of the rest of the world. Yet, we believe, as consumers, that we are sitting by, impatiently waiting for some engineer or inventor to give us a better world; certain that, when the time comes, we shall quickly discard the old and adorn ourselves with the new. Unfortunately that is not true.

People do not grasp all new inventions with such gusto, especially if the new idea means changing of habit. We are a lazy people but we also hunger for importance and thus we find ourselves performing tedious tasks in a wearisome way just because the old way makes us important. When the old fashioned radio required painful tuning it made the operator a man to be sought after. When someone would call, "Dad, will you tune the radio for us?", Dad felt an undeniably surge of elation. With the advent of simple radio tuning Dad lost the thrill of his former achievement.

The man who drives a motor car with a host of gadgets on the instrument panel imagines himself as a little God in charge of an involved little world. If his motor is 100 horsepower, he is the king of 100 horses. When he sees the inside of an airplane he gapes at the instrument panel with envy. What fun it must be to pull this lever, push that button, turn that control.

It is this sort of dreaming that is integral with man, which confuses many a manufacturer who, with scientific naivete, produces a device which calls for no attention and fails to arouse sufficient interest on the part of the overburdened man it is to relieve.

When you look upon human beings as psychological creatures instead of rational, thinking machines you get a better idea of how they function. A woman will pay \$3 for a pair of hose and insist that they be invisible. A man will spend hours building something in his basement which he could have purchased for a dollar. You've seen the same man drive his car at breakneck speed through traffic in order that he may arrive home three minutes sooner—to do nothing. A home owner gets a certain surreptitious thrill out of taking his friends down in his basement and talking about his heating plant. If, on the other hand, his heating plant is so efficient that it functions without his slightest consideration, he cannot boast about his contribution and his ego suffers.

Of course, here you have an inner conflict. He wants leisure yet he resents losing his personal importance. And there you have one of the underlying factors which drives people to exhibitions and home building shows to see—to dream—and to forget.

Shopping Gives Vicarious Thrill

A woman can window shop for hours without a cent of expense. She can mentally try on every dress in the window and enjoy the thrill that goes with it. And it costs her nothing

in money and nothing in inconvenience. A man can wander through a hardware store, touch this hammer, try that drill and walk away thoroughly satisfied. It is psychologically possible for him to project the feeling of holding a drill into personal ownership.

Now let's visit the home building show. Thousands of people come. Even if admission is charged the place is jammed. Let's talk to some of the folks. Here's a man of about 45 and his wife. They are wandering through the place aimlessly. They stop to admire a heating plant. "So clean," she comments. "You'd hardly think of it in a basement," is his retort. They move along. She sees an attractive kitchen, stops, sighs and walks past. Don't be sorry you missed them. They do not own a home. You can be 45 and married without owning a home. They just came in to look.

Here is a young lady—about 23 years. She is loaded down with booklets—costly literature—expensive brochures that cost some manufacturer a good piece of money. She'd like to own a home—some day. She reads "House Beautiful"—visits model homes—dreams—and dreams. Let's follow her home. On the street car she loses some smaller pamphlets. It makes little difference to her. At home she dumps the literature in a drawer. She'll read every piece tomorrow night. She never does. Sis finally cuts the pictures out and Mom throws the rest away.

So you think these are the exceptions. The ratio of good prospects who see a model home or visit a home building show to those who are simply "waiting for a street car" accounts for the high loss in results. Nothing is more injurious to a manufacturer's morale than a crowded hall and an empty order book. Of course, I'm speaking of normal times.

At one time automobile shows were free. Then, to keep out the riff raff an admission was charged. But the riff raff found the 50c and came along for the ride. They opened and closed doors, grabbed steering wheels and kicked tires. Yes, plenty bought but the ratio wasn't right.

We are a nation of dreamers. We can see a movie and get a second-hand thrill. We can project ourselves into a book and get a bang out of someone else's adventures. And we can visit a home show, pick up a booklet and go home feeling almost as good as though we had bought a home. That ability has made us the biggest book buyers in the world, the greatest movie goers in the world.

Live Prospects Scarce

Of course, people are buying homes—buying heating plants. But the energy that is lost on dead prospects is terrific. And the delusions of success which such dead prospects give you would be enough to break anyone's heart.

You must qualify your prospects now, more than ever, since

the public is home-minded and heating-plant minded. You can't stop them with a 50c admission charge to a show. You can't stop the curiosity seekers by insisting that they must send you 10c to pay postage on a book that cost you 50c. Don't be afraid to ask in your display booth and in your advertising—"Do you own your home?" or "Do you plan to build a home—and when?"

Most manufacturers are so eager to get their advertising matter into the hands of possible consumers that they forget that people are not all prospects. Don't be afraid to risk the loss of a *dead* prospect. Qualify everyone before you waste too much time. With the shortage of trained help every call must be made to pay out. A good man can lose heart and lose plenty of time, too; calling on curiosity seekers while good prospects are neglected.

One organization decided to stop asking for leads. They found that salesmen will neglect everything to follow a lead and that many inquiries are not worthy of too much attention. You see, if you make it easy to ask for your literature you get curiosity seekers. But if you qualify your inquiries you may become worried that you are losing prospects. Well, you're not.

Effective Advertising Works!

If your advertising is doing a good selling job, you'll get inquiries that are worth going after. It has long been the objective of advertising men to draw in large numbers of coupons. Radio is constantly trying to do the same thing. People will buy a product if that is required to enter a contest but they do not *want* the product and its purchase is as a lottery ticket not as merchandise. If a sale is compulsory it does not engender good will. And contests are coming back—and mail bags will be filled with entries—and advertising men will have their photographs taken with broad smiles of achievement. And manufacturers will scratch their heads in amazement that so much fireworks can net so little business.

When you say, "Send for richly illustrated full color bro-

chure showing attractive basement playrooms, complete with diagrams, blue prints and full details," you are tempting fate. Many an apartment dweller will risk a three cent stamp or a post card to look into the charming basements you will show.

Qualify! Qualify! Qualify! Open the doors wide to everyone but put on your glasses (not rose colored) and give them all a careful scrutiny before you glow with inner satisfaction. When they tell about Tom Thumb who put in his thumb and pulled out a plum—he was at least poking around in a plum pie. And if you want plums don't expect too much if you place temptation in the way of home-hungry people.

If you advertise for inquiries use such questions as these in your coupon:

Age. Married or single. Do you own or rent? Do you plan to buy a home? To build? When? Have you ever owned a home? Did your parents own their home? How many rooms will you have in your home? What do you think you would spend for a home?

You don't need all that information but it will give you a check and cross check before you invest from \$5 to \$50 in following through for a sale.

If you exhibit at a show, don't pile a lot of expensive booklets on the counter for everyone to pick up. Make them sign for your material and you can send it. Many smart manufacturers are doing just that. A simple card will allow for qualification of the inquirer. Then you can send out your literature according to the justification. Make your exhibit appealing. Have competent people in attendance to answer questions and do some pre-selling. If you do that, then the inquiries you get will be worth something to you.

Above all, don't lure your listeners or readers with tempting bait and expect to get sincere replies. People are human. They want homes—they want heating plants—they want comfort. But they must have money—a home to put the heating plant into—otherwise you're tossing your time and money into a pipe dream which the other fellow is smoking.

The Parable of the Rotten Apples

Uncle John, who was getting along in years and who was not as spry as he used to be, lived in a modest house on an acre of land two miles from the village.

Upon the property were several fine apple trees producing large red apples. Each year Uncle John made a little money by selling these apples at 3c each.

Uncle John hired a young fellow named Pete to pick and pack the apples and load them on the truck and paid him \$1 an hour for 8 hours work each day. Pete worked. It also cost Uncle John an additional \$2 a day for baskets and to get the apples to market.

Pete picked 10 baskets of

apples a day averaging 50 good apples to a basket.

In 1941 the picture looked like this each day that Pete worked:

10 baskets of 50 apples each at 3c an apple.....	\$15.00
Pete's wages—8 hrs. x \$1.00 per hr.....	\$8.00
Cost of baskets and marketing	2.00 10.00
Uncle John's profit per day.....	\$ 5.00

In 1942 Pete joined the Apple Pickers' Union and paid dues of \$1 to the Union each month. The Union Agent told Uncle John he should give Pete a 50% raise or \$1.50 per hour, which Uncle John agreed to do. The cost of baskets and marketing

was now \$2.75 each day.

So, in 1942, this was the picture:

*10 baskets of 50 apples each at 3c an apple.....	\$15.00
Pete's wages—8 hrs. x \$1.50 per hr.....	\$12.00
Cost of baskets and marketing	2.75 14.75
Uncle John's profit per day.....	\$.25

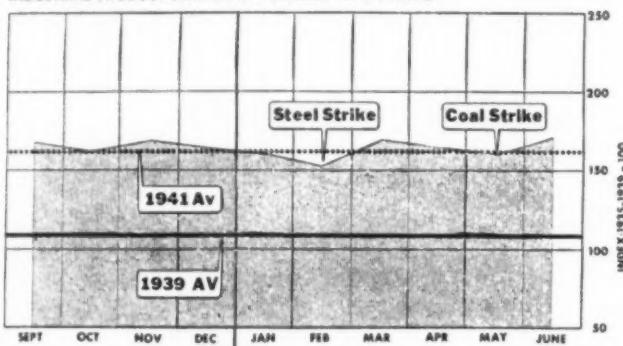
In 1945, after V-J Day, the Union Agent raised Pete's dues in the Union 50% or to \$1.50 per month, and said that on account of possible inflation Pete should get a raise to \$2 per hour. Uncle John said No unless the OPA would raise the price per apple.

In 1945, after the Union
(Continued on page 114)

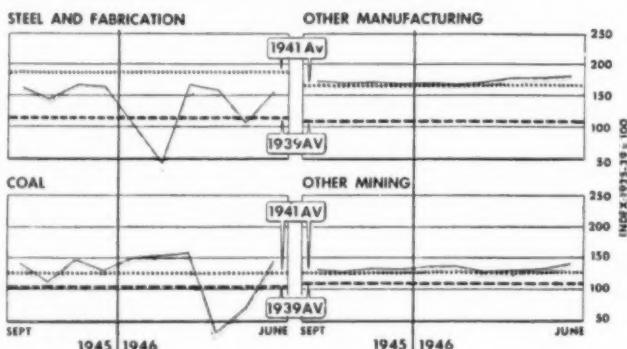
INDUSTRIAL PRODUCTION IN RECONVERSION

Since VJ-Day total production in factories and mines has been above 1941 level except during steel and coal strikes.

INDUSTRIAL PRODUCTION...MANUFACTURING AND MINING



Although hurt by the losses in steel and coal, other industrial production continues to break records.



FEDERAL RESERVE INDEX: May data preliminary, June estimated.

AMERICAN ARTISAN here presents a summary of the seventh report to the President and Congress by the Director of War Mobilization and Reconversion. This report entitled "At the Crossroads" and dated July 1st, was signed by Mr. John R. Steelman, Director of WMR.

The Production Record

In spite of the great setbacks that were encountered by industry in the first half of the current year, figures show that goods are being produced at a record peacetime volume. The major work stoppages that took place this year have had a decided retarding effect on production, but the overall picture is brighter than the situation which exists in some particular industries. Since the end of the war the amount of goods available to private purchasers has risen steadily, but the total output of our economy declined, to some extent, between V-J Day and the end of 1945. The first quarter of 1946 marked the end of this decline, since total output of the civilian economy for that quarter was at the annual rate of \$167 billion. During the second quarter of 1946, output rose to an estimated rate of \$174 billion, although part of this rise was due to price increases. In spite of the curtailment of steel and coal production, with accompanying shortages in steel products, output of automobiles and some durable consumer goods—such as gas ranges, washing machines, electric irons

"At The Crossroads"

A Progress Report on Our Nation's Reconversion from the Manufacture of the Tools of War to the Goods Needed by a World at Peace.

and vacuum cleaners—rose markedly during the second quarter over their first quarter levels. Famine relief caused shortages in the production of flour and flour products, but production of most other non-durable goods continued at a good rate.

Why Do We Still Have Shortages?

Accepting the figures in this report as indicative of tremendous output of consumer goods at this time, many people are inclined to wonder why shortages should still exist in many commodities that are needed for everyday living. Part of the answer lies in the wartime curtailment of production of many consumer items. During the war years when these goods were out of production the need for replacement pyramided in many of these products and as a result the present day demand is far beyond the normal, peacetime demand for durable goods. Thus comparisons of present day production figures with those of 1941 are legitimate only insofar as they show how we have reconverted our wartime production machine to the output of peacetime consumer needs.

The significance of this is that production of many civilian items can equal and surpass the 1941 production but still fall far from meeting 1946 demand. It is unlikely that a balance will be established between supply and demand for some time to come.

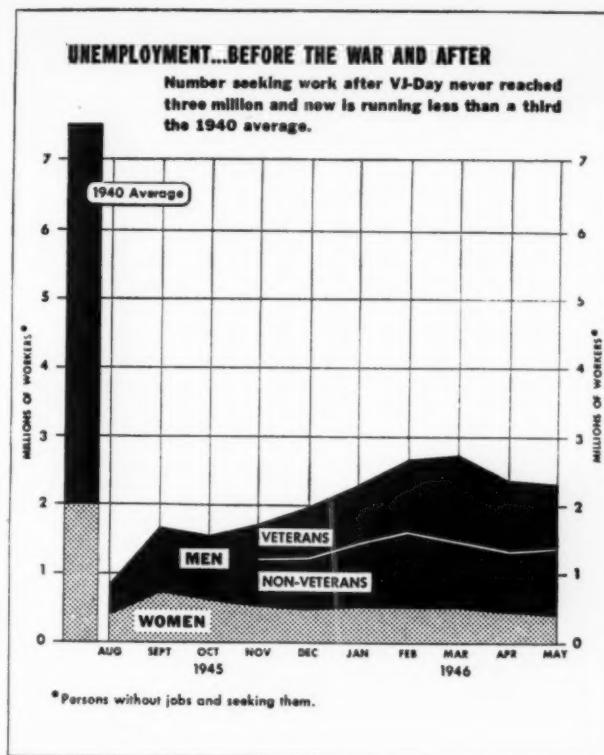
As to actual figures on production, during May of this year automobile production was only at 49% of the 1941 rate and refrigerators were being turned out at 63% of the 1941 rate. Some improvement has been made on these totals as of the first of September. Automotive production, including trucks, has reached 91,360 units per week (week of August 19) or an annual rate of over 4,000,000 units. This has been the post-war high point and the total has already declined somewhat because of the very serious lead shortage. To date, radios, passenger car tires, washing machines and vacuum cleaners are running ahead of their 1941 production rates but as explained above they are still insufficient to meet the demand for these items.

The Employment Picture

Possibly the most encouraging thing about the entire production situation is the way in which the predicted unemployment problem has failed to materialize. Dire predictions were voiced, at the war's end, that perhaps 8 millions would be unemployed by the spring of 1946. Spring came and in May the total persons unemployed and actively seeking employment amounted to two and one-half millions, but the demand for workers continues so strong that now predictions are being made of a serious labor shortage before the end of 1946. Current employment in the United States has reached a point of about 58 million persons employed or only two millions below the ephemeral '60 Million Jobs' that was advanced some time ago by Commerce Secretary Wallace as the need for full employment and prosperity in this country. The employment picture for veterans has been much better than had been expected because eight out of every ten demobilized veterans are now employed. Since February veterans have been employed at a rate higher than the rate of demobilization.

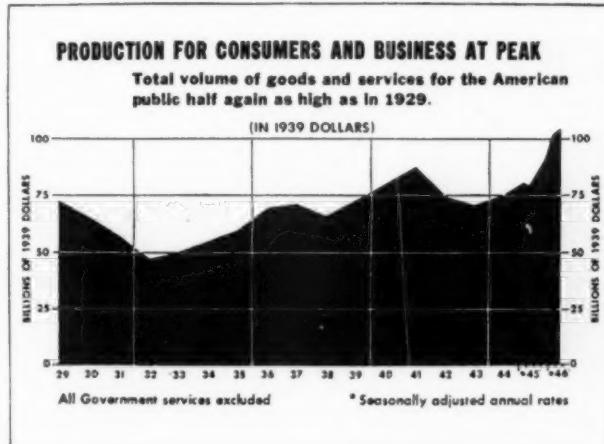
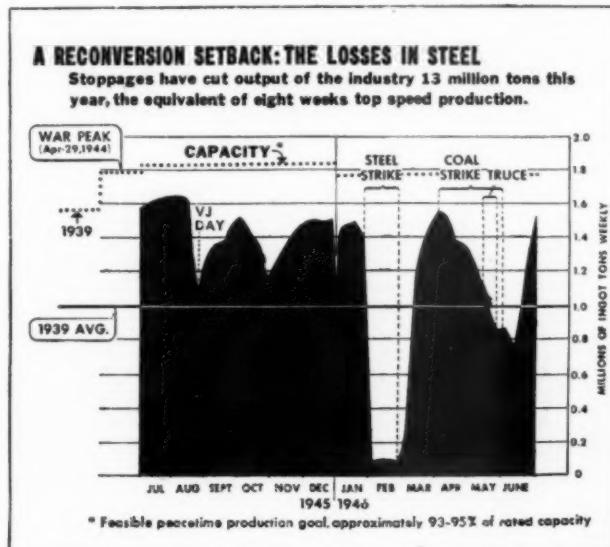
Key Material Shortages

When plans were being made for reconversion from war production to peacetime civilian production, one of the basic necessities for successfully carrying out the plans was that the many shortages of raw materials which had plagued us during the war must be eliminated. Iron, steel, copper, lead and tin had to be obtained in sufficient quantities if we were



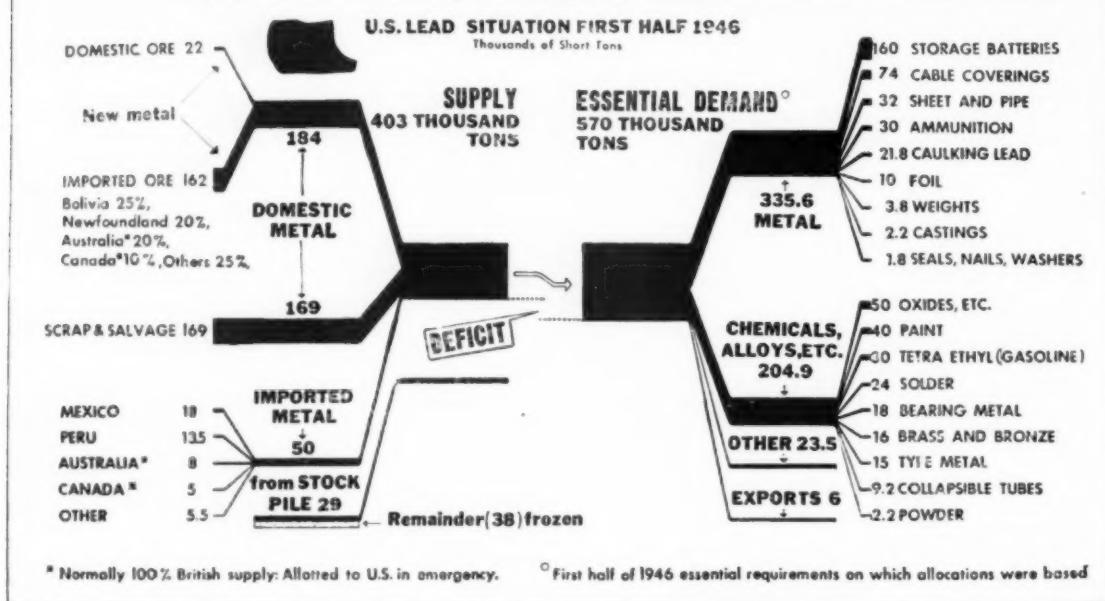
to produce at rates equalling or surpassing our pre-war production rates. But in January came the steel strike which cost us 13 million tons of steel this year or the equivalent of eight weeks production at top capacity. Immediately on the heels of this tragedy came labor-management disputes in the iron ore, lead and copper mines, in smelting and refining facilities and finally in the coal mines. To further complicate the situation our exports of copper, lead and tin fell below previously established goals.

At this time most of the disputes have been settled, but the harm has already been done since capacity operations for the remainder of the year will be unable to compensate for the losses in production in the first half of the year. The steel industry is currently operating at about 90 per cent of capacity as opposed to a projected feasible peacetime goal of 93-95% of rated capacity. And now even this total is threatened by the



A LOOK AT ONE POSTWAR SHORTAGE...LEAD

The shortage of even a relatively simple material presents complex problems...of increasing supply from far-flung sources, of whittling down demand from hundreds of essential products.



The diagram reproduced above is printed to show the intricacy of the supply and demand situation in modern industry and the way in which the shortage of one basic material can have far-reaching effects on many products. At the present time it is possible that the automobile manufacturers may ship their October and November production out without batteries because of the serious shortage of this very commodity—Lead!

growing shortage of scrap. The mills must have scrap if they are to produce and each day sees a diminution of the scrap supply with very little coming in to the scrap stockpiles of the steel mills.

Steel Priority Controls

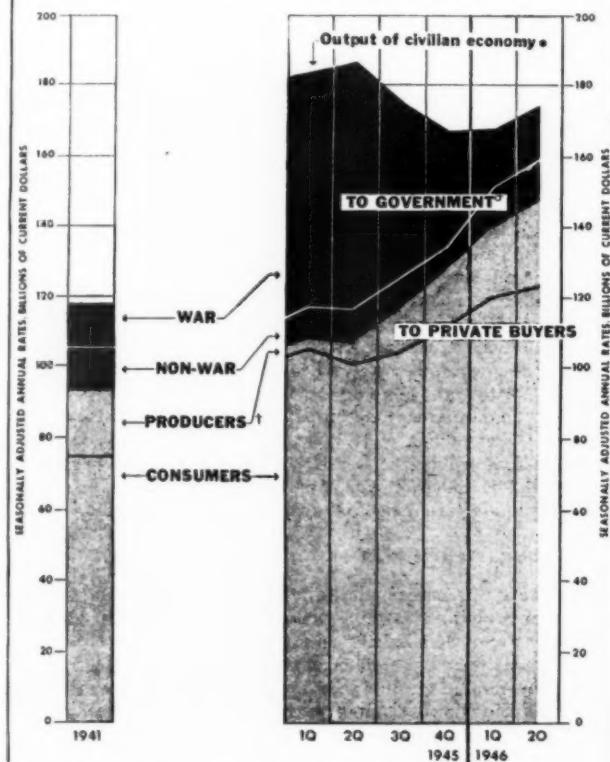
As a result of the acute shortages of steel, the Civilian Production Administration found it necessary to set up a distribution system for steel in order to channel it to the industries which were most essential to the Veterans Housing Program and the Famine Relief Campaign. Steel has been allotted to manufacturers of products used in housing, including warm air furnaces and to manufacturers of farm equipment, which is vitally needed for the 1946 harvest. These controls have been established on a temporary basis and they are to be lifted just as soon as the need for them no longer exists.

As an example of the serious problem that is posed by a shortage in an essential material we are publishing a graph giving the pictorial story of the lead shortage. It shows where the supplies are obtained and balances the total supply against the estimated demand and arrives at a shortage which then necessitates either an increase in supply or a curtailment in demand. The picture in other materials has been very similar to that in lead. This should furnish some indication of the difficulties encountered in solving the many shortages that have beset us. And it is the lead supply problem which is affecting auto production.

Weighing all the production figures and taking into consideration the factors which affect them, if we do not experience another outbreak of crippling strikes the first day of 1947 should see us well along the road to a balance of supply and demand and a good beginning on that post-war world that so enchanted many people when it was discussed during the lately ended war.

PRODUCTION UP

Government buying declines; private purchases mounting rapidly.



* Excludes services of armed forces and interest on the Federal debt.

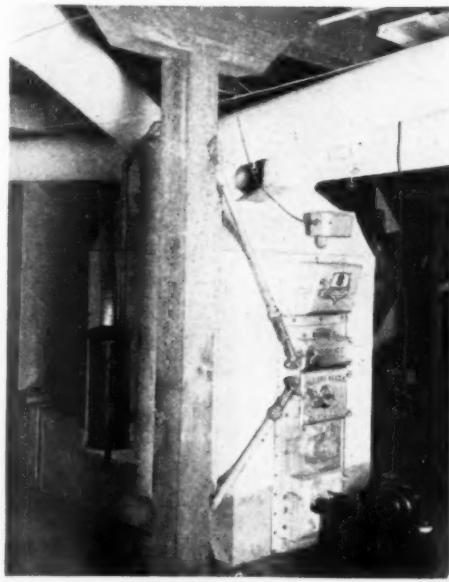
† Includes Government civilian payroll.

‡ Private capital formation: i.e. construction, producers' durable equipment, net change in business inventories, net exports.

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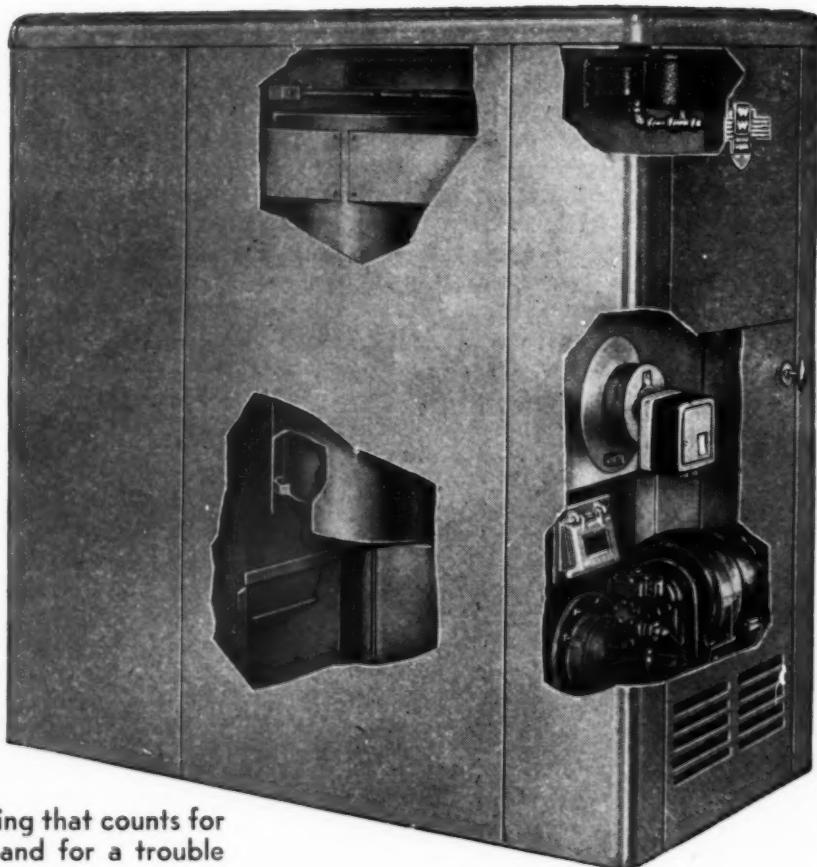
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What's Ahead in Postwar Stokers?

IT IS a pretty sure thing that postwar stokers will have a strong family resemblance to their older brothers; but it is equally certain that the war period was not wasted and that the production techniques learned during the war will have been combined with the operational experience gained before and during that period to build better stokers than those we have had heretofore.

Must Have Sales Appeal

The stoker manufacturer must make a product that will appeal to the consumer in sufficient degree that he will spend his money for such a product in preference to a new radio or washing machine or oil burner, or even for a competing stoker. There must be a nice balance between what is put into and what is left out of the stoker. So the stoker must be well and honestly built to give the customer trouble-free performance and a reasonable life expectancy. If it is to be salable over a wide territory, it must capably handle many coals of widely varying characteristics, or it cannot be built and sold in volume, it will be high in unit cost, and it will appeal to only a limited market. The stoker must be pleasing in appearance or it will suffer in comparison to others on the salesroom floor—for that is where sales are made. Dimensionally it must be adaptable to a wide variety of boilers and furnaces, otherwise it cannot be installed in many homes. Stoker men know that the conversion market still is their bread and butter.

Clean Coal Helps Sales

Economics still dominates the stoker market as it does all others. People who can afford higher heating costs often choose oil or gas because they haven't been made aware of the change in coal and coal firing. The preparation of coal today by the better operators has produced in stoker coal a fuel that is clean to handle and which customers prefer even at increased costs per ton. Some say that the increasing number of stokers soon will require the crushing of larger sizes on an increased scale. "Why not build a stoker that will take anything up to two or three inch sizes?" they ask. "Well, why not?" If these people have the courage of their convictions and the money to back them, the field is open.

* From an address: "DOMESTIC STOKERS," by A. O. Dady, Chief Engineer, Stoker Division, David Bradley Manufacturing Works, Bradley, Illinois, presented at the "Housing and Heating Conference," Pennsylvania State College, State College, Penna.

Economics is also dictating the building of smaller, more compact homes. The comfort value of insulation, winter and summer, is more widely appreciated. Heat losses and, likewise heating plant capacities in postwar homes, will be lower than those for homes built before the war. These small, low heat loss homes carry with them these implications: first, the reduced size of the heat exchanger unit will require stokers of correspondingly smaller capacity and physical size; secondly, burning rates per square foot are likely to increase rather than decrease, for the burners must be reduced in area to fit into the smaller firebox and still leave room enough around the outside for either clinker storage or ash removal; and thirdly, smaller burners in turn require that the diameter of the feed screw and tube be reduced, with the result that the top size of the coal that can be handled without crushing is lowered.

The alternative is an entirely different method of feeding and burning the fuel, and also, of removing the ash. If there is such an alternative, it has not yet appeared either in the patent literature or on the market.

Clinker vs. Bin Feed Types

I think we shall find for some time that the clinker-type stoker is still the dominant class, particularly in the smaller sizes. In the sizes adapted to large homes we may expect ash removing, binfeed models capable of handling a limited variety of coals not well adapted to the clinker type. Much experimental work has been done on these, but they still have to be simplified and refined to lower their first cost and higher service expense if they are to offer serious competition to the class of buyer who is in a position to afford them instead of oil or gas. The binfeed stoker in the clinker type is gradually gaining ground and will do so faster if architects and builders will give any consideration to the location of the heating plant and bin with relation to one another and in relation to installation requirements. It still isn't easy to pipe coal around three or four corners.

Salesmen, generally speaking, have failed to take full advantage of the opportunities offered them when interested prospects permit them to survey their homes. For example, a year-round, low cost, domestic hot water supply, using the stoker, is one of the better sources of additional profits most frequently neglected. Besides, there are many others, from new smoke pipe or chimney cleanout doors, to major heating plant repairs and improvements, which an intelligent survey will uncover and aggressive salesmanship can convert to plus profits.

Panel Heating – A Basic Discussion

By S. Konzo*

*Special Research Professor, Engineering Experiment Station, University of Illinois.

This material was presented by Prof. Konzo at the annual convention of the Sheet Metal Contractors' National Association, Inc. As the first in a series of articles on Panel Heating, the editors feel that it will clear up some of the loose thinking on the subject, and provide background for what is to come.

RADIANT heating originated on the Continent and a great distinction exists between radiant heating and panel heating. Examination of the 1946 Guide of the American Society of Heating and Ventilating Engineers will indicate that these two terms are not synonymous. Radiant heating is heating in which the surfaces of the building structure are at a temperature considerably greater than two hundred degrees. Panel heating, however, is heating by building surfaces which do not exceed a temperature of one hundred fifty degrees.

Radiant heating can best be explained by use of an example. If an electric coil is placed in the ceiling of a room, shining down into the room, when the coil becomes incandescent it will have a surface temperature of as high as fourteen hundred degrees. This produces a radiant effect; in other words, the heat is transmitted through the air to the object being heated.

Early Experiments in Hospitals

First use of this type of heating was in hospitals and sanitaria in Europe and England and Doctor Barker, of England, led in the application of this heating discovery. Open air sanitaria set the system up so that each bed was focused in the spotlight of these truly radiant heaters.

It is possible that under those conditions, the air temperature might have been forty degrees. The person, however, was in a bed, and the spotlight was shining just on his face, consequently, it was comparatively easy to keep the occupants of those beds comfortable, even though the air temperature was around forty or forty-five degrees.

As far as this country is concerned, the radiant system is practically unknown. We have very few actual radiant systems in this country. There are a few electrically heated bath rooms where we have electric coil type heaters that are turned on momentarily whenever the bath tub is used, but those jobs are so rare that as far as American practice is concerned, we can more or less ignore radiant heating; we can't ignore panel heating, but I think there has been a great misapplication of some of the principles of radiant heating.

If you will recall in literature, particularly articles in the consumer's magazines, you will hear a lot of arguments how you could maintain fifty degrees air temperature, and be just as comfortable as in a room heated by other conventional types of heating systems. That came because they were interpreting data from a radiant heating coil of a thousand, fifteen hundred degrees, and saying, "Now, you are going to get the same effect when you have a panel at a hundred and twenty degrees."

The two things simply don't go together at all, because the radiant effect from a panel is one hundred twenty; from the radiant effect of a coil, a thousand or fifteen hundred degrees. You will find, therefore, that the initial outbursts about how much lower in temperature you can maintain your room in subsequent years, have been discontinued.

Air Must Be Warm

People have found out that you just don't get those effects, regardless of what kind of heating plant you have, panel heating, hot water, steam, or warm air. Experience has proven in general that the air temperature has to be very close to seventy degrees in order to be comfortable. That is American practice with panel heating, so that if some of you do hear about some of these arguments that came from those initial experiments on radiant heating, I think you can very well disregard such claims entirely.

There is very little difference as far as the air temperature is concerned. I don't know whether I am jumping too fast for you or not. Some of you may want to know what radiation is, as contrasted to convection. The effect you get from a fireplace is the heat radiated from that hot coal to your body. That radiation passes just like light. As a matter of fact, radiation is a form of light, or put it the other way around, light is a form of radiation.

Consequently, it travels in a straight line. It travels more or less indefinitely. The farther you get away from it, the less the radiant effect becomes. To be specific, it reduces by the square of the distance. Now that is radiation. Convection is the sort of effect that you get from a steam radiator when the air passes over it and heats the room. We have the same effect in a warm air system. The warm air system is to a very large extent, convection heating. However, I would like to point out to you this, there has been a great deal of loose thinking, to my notion, about both panel heating and convection heating. In the first place, a panel system is not one hundred per cent radiation and zero per cent convection, as some people think it is.

Neither is the warm air system one hundred per cent convection and zero per cent radiation. In other words, the gulf is not between one hundred per cent radiation and zero convection. Actually, the difference is very much smaller. Let me give you a few figures that are given in the guide. If we take a ceiling panel, in other words, if we have a ceiling surface of about a hundred and fifteen degrees, which we can do by the use of steam coils or warm air passing through the ceiling surfaces, we have a radiation component of seventy

per cent, a convection component of thirty.

In other words, for a ceiling surface, the radiation component is seventy and thirty. Now, that is percentage. In other words, if you have one hundred per cent heat released from a ceiling surface carried at one hundred fifteen degrees, we have those components. In the case of walls maintained at a hundred and twenty, that is where you have a wall panel, either air, steam, or hotwater, we have a radiation component of sixty-five, a convection component of thirty-five per cent. In the case of heated floors, maintained as high as ninety degrees, the radiation component is about fifty-five and convection is forty-five.

Just imagine a floor surface being warmed. Obviously, that floor surface is going to radiate all around, but on the other hand, you know that air currents are being set up and consequently about fifty per cent, forty-five per cent, to be exact, is obtained by the convection current rising off that floor.

You can see, therefore, that the straight radiation effect decreases as you move that heated surface to the ceiling, to the side wall, down to the floor. Now, the arguments that are being put up sometimes, the part that aggravates me more than anything else, is the impression that any radiant or panel heating system is one hundred per cent radiation, and any other type of system is zero per cent radiation.

Some Test Results

The fact simply is not true. I would like to quote, for instance, from the results obtained in the I.B.R. Home. That is the other research home that we have on our campus. In that building, they use the forced hot water circulating system, rather low temperatures of water, definitely below steam temperature, small pipes, and there is one statement in the summary or the abstract, that has always interested me a very great deal. The statement made is as follows: That, of the heat necessary to offset the heat loss from a room, less than fifty per cent of the effect was obtained from the radiators.

In other words, let's put it this way; suppose you had this room heated with that particular type of system, with convectors or small hot water tube radiators along the wall. Less than fifty per cent of it came through the radiators. The rest of it came from where? It came from what we call vagrant heat sources, from the pipes, from the boiler room, from the chimney, from the sun, everything else. In other words, we have, even in a forced hot water system, which is certainly one of the best temperature mediums we have in the boiler field, a very large component of radiation.

I don't have the exact value because it is rather difficult to say what it is, but we definitely know that the radiation from a convectional system is not zero. We have the same effect, if not greater, in a conventional warm air system. We have made a number of tests in that residence with various types of heating plants. One experience has stood out in my mind as one of the most startling things I have ever seen. They have a living room thirteen by twenty in size with six windows of rather ample dimensions. They are three by five, fifteen square feet each, which gives a rather high heat loss because of the three exposures, but in one of our tests, we had a stoker fire forced air furnace located immediately below that room. We balanced the registers to give us six hundred feet per minute at each register.

We did that by putting a mask behind each register so that we finally got the required air velocity out of it. Our calculations indicated that particular room required one register approximately five by fourteen in area, but due to the fact

that we had a warm floor below, eighty-five degrees air temperature right below the joist, the fact that we had a part of the chimney running through, and the fact that we had three stacks going up in the inside walls, when we finally balanced that job, our register opening was an opening two inches wide by three inches high.

I have had a lot of people come in there, and I pointed that out, saying, "Look at that, we are heating with that little slot up there." They accused me of having some other hidden means of heat below the carpet. We did have, down in the basement. That was a case where the actual balanced requirement of that room was being supplied by an opening six square inches in area. In other words, we were getting twenty-five per cent by convection, seventy-five per cent by radiation effects. Consequently, I maintain that the discrepancy between a so-called straight panel job and the convection type system, is not one hundred per cent. It is something on the order of sixty-five to thirty-five.

Is it any wonder that in these tests reported by a large number of people, they have found that in order to be comfortable, they have had to maintain the same room temperatures that we have always had to maintain in any other system? I am not trying to use this as a means of blasting radiant heating or convection heating. I am merely trying to set you straight on some of the things, so you will be able to distinguish between claims and good arguments.

Arguments for Panel Heat

I think there are a number of advantages of panel heating, advantages looked into by the warm air heating industry. In the first place, the outstanding advantage, to my notion, is the fact that the heating system is not apparent in the living quarters. That appeals very strongly to the architects and to home owners. Other industries and this industry have had to compete with that basic argument, and they have done so. You will find in the case of a convection type radiator that the method they are now proposing, is to eliminate heating equipment from the rooms by the use of baseboard radiators, or by the use of convectors. In other words, any device which will get away from standard convection in the room itself. I think the trend is very definitely for side wall registers, for that one reason, if nothing else, regardless of whether or not you get better air conditions.

The idea of getting equipment out of the way of the furniture has brought this about because of this competition of panel heating, but there is that one advantage that you have to meet. The second advantage of panel heating is undoubtedly the fact that you do get a warm floor and the fact that you do get a warm living room condition in the living zone.

Ceiling Against Floor

That is a very strong argument and one undoubtedly, that will play a very large part in consumer acceptance. We have interviewed or written to a large number of so-called experts in the field. To my notion, it is rather interesting to find the divergence of opinions as to where a panel should be. We find two distinct schools of thought at the present time. One proponent of panel heating believes that it should be in the floor, primarily because it is much easier for that particular enthusiast to install his wrought iron pipes in the floor.

On the other hand, you will find the majority of the experts swinging in the other direction. I won't try to name the experts, but I think you will recognize the fact that there are



On the left is shown a fairly typical installation of a hot water panel in the ceiling of a residence. Photo on the right shows an instance of a floor panel as well as an auxiliary panel in the wall.



at least three companies and three non-commercial men who definitely prefer the ceiling panel. Their arguments are as follows, and I am merely quoting. They claim that in the case of a small panel whenever the temperature of that floor panel exceeds eighty-five or ninety degrees, you run the risk of getting a hot foot.

If you realize that floor panel or a ceiling panel is nothing more or less than the conventional steam register, you realize that the temperature you maintain in that floor panel is going to very definitely limit the quantity of heat which you can dissipate from that surface. In other words, we say that a conventional steam radiator gives off about two hundred forty-five Btu per square foot.

We say in a conventional hot water radiator system that one square foot gives off one hundred fifty Btu per square foot. By the same token, some of the experts have quoted figures showing that with a floor panel heated to a maximum temperature of eighty-five, that the most you can get out of it into the room is in the order of thirty or thirty-five Btu per square foot.

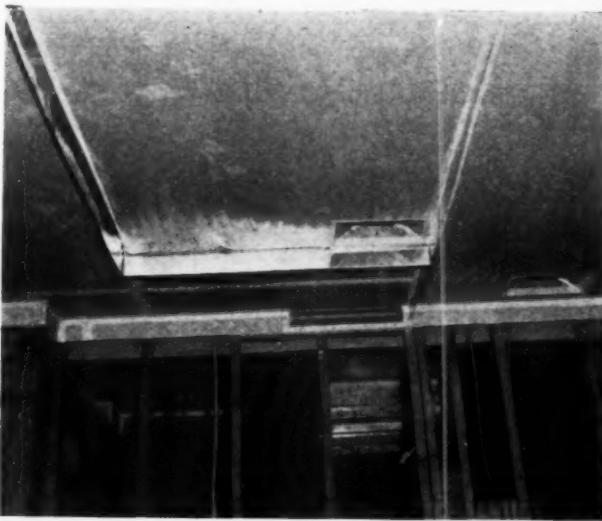
If such is the case—I say, "IF"—because there is a great difference of opinion on the subject, if such is the case, then it means that you very definitely have to correct the heat loss of the room against the heat emission from the floor. Let's

imagine a house having one thousand square feet of floor area, the area of a very common type of home at the present time.

If the floor surface will only give off thirty-five, let's call it forty, Btu per square foot, you can say that we will have a total heat emission of thirty-five or forty thousand Btu per hour. That means we have to be sure that heat loss in the walls, ceilings, windows, infiltration will be thirty-five thousand to forty thousand or less. That means, therefore, that the construction of the building very definitely has to be checked in any floor panel system.

Those limitations are not as acute in the ceiling construction, for the simple reason that in the ceiling panel, due to the fact that we maintain a hundred fifteen degrees temperature instead of ninety degrees, you can get a heat emission value of seventy-five or eighty without much difficulty. Consequently, it can be applied over a much larger range of construction. In other words, you don't have to build your house down around your heating plant. You can accommodate a very wide range of structures without any difficulty. That is one argument that has been put up by the ceiling people, the limitation of the floor as far as maximum heating release is concerned. The proponents of the floor system counter with this argument. They say that there is no such limit.

The picture on the left is a warm air floor panel using sectional tile for a distribution medium. The warm air is introduced at the center of the house and is conducted to the outer walls where it is brought up into the rooms for purposes of ventilation. To the right is a warm air ceiling panel showing the top insulation used and the way that the warm air is channeled by means of directive fins.



Remember, I am neutral on this subject. I am trying to report to you what we have been trying to find out from both sources. The proponents of the floor panel say there is no limit of forty Btu. They claim they have put sixty-five Btu per square foot. They have run up to ninety degrees and have had no particular trouble. The answer is going to lie with more experience.

We don't know, as a matter of fact, who is right. Offhand, I think the majority of the experts are on the ceiling panel side; when you talk to a home owner about panel heating, I think nine persons out of ten will immediately think of a floor panel rather than a ceiling panel. Yet, the ceiling panel experts think that is the way it should be, up there, rather than down below. The second argument that the ceiling panel people put up is one that is very serious in nature. They claim that most of the floor panels are going into concrete slab floors.

Difficulties With Concrete

Concrete weighs approximately one hundred and twenty-five or one hundred fifty pounds per cubic foot. If you have a six inch layer of concrete, two square feet in area, you can see that you have one cubic foot of material. The specific heat, so-called, of concrete is roughly of the order of 0.25 Btu. Consequently, you have a heat storage mass in a concrete floor that is tremendous. You can make calculations and if

they are any good, you will soon find out that it takes an enormous amount of heat to raise the temperature of concrete slab floors.

Conversely, when the slab is cooling off, you get a tremendous amount of heat returned into the house. Ceiling panel people claim that when they insert their pipes or air below a plastered ceiling that the mass that you have in that ceiling plaster is only an infinitesimal proportion of the mass in a concrete floor. Consequently, they claim you do not have this heavy flywheel effect that gives over-heating and under-heating, and I think they have a great deal to say for their side.

Let's examine this matter of the floor slab, because that for the present moment at least, is one of the most commonly thought of types of construction. I realize that in the building industry, we are passing through a transition phase. Steel is scarce, wood is scarce, contractors have to build houses, and they are looking for every means possible to cut down on critical materials, with the net result that we find in industry a very large acceptance of the use of a concrete slab with a minimum of steel and a minimum of wood. It may be that that phase is a passing one. It may ease up in a year's time. In other words, as soon as wood becomes available, steel becomes available, we may come back to common wood joists in construction, simply because the carpenters are more used to that type of work.

(Continued on Page 118)

Reader Asks for Suggestions-

Writes an AA reader:

In our shop we get orders for lids to cover garbage cans and other containers. Our local ordinance requires a 1½-inch rim. Is it possible to spin 26 or 28-gauge galvanized iron to form such a rim? We do not have a press brake.

This is the only help AA can give.

It is possible to spin covers with a 1½-inch rim in 26 and 28-gauge galvanized iron if you

can find a horizontal lathe large enough to take the required diameter. You will need a wood die and a suitable set-up on the bed against which to operate the spinning tool.

In 1940, we published an article describing the procedure used by a Fort Worth, Texas, shop to spin somewhat similar covers, excepting in stainless steel. This operator made a wood die, shaped exactly to the contour of the finished cover and placed this die flat in a

home-made machine. A roller which turns round and round on a shaft above the die, presses the metal into the die. The necessary pressure to force the metal and the roller into the die was obtained by a screw shaft and wheel similar to the old-fashioned paper press. You could build a similar machine. The only drawback we can think of is that you would have to have a separate die and a separate roller for each diameter of cover you form.

Pattern for Three-Piece Offset

By Wm. Neubecker

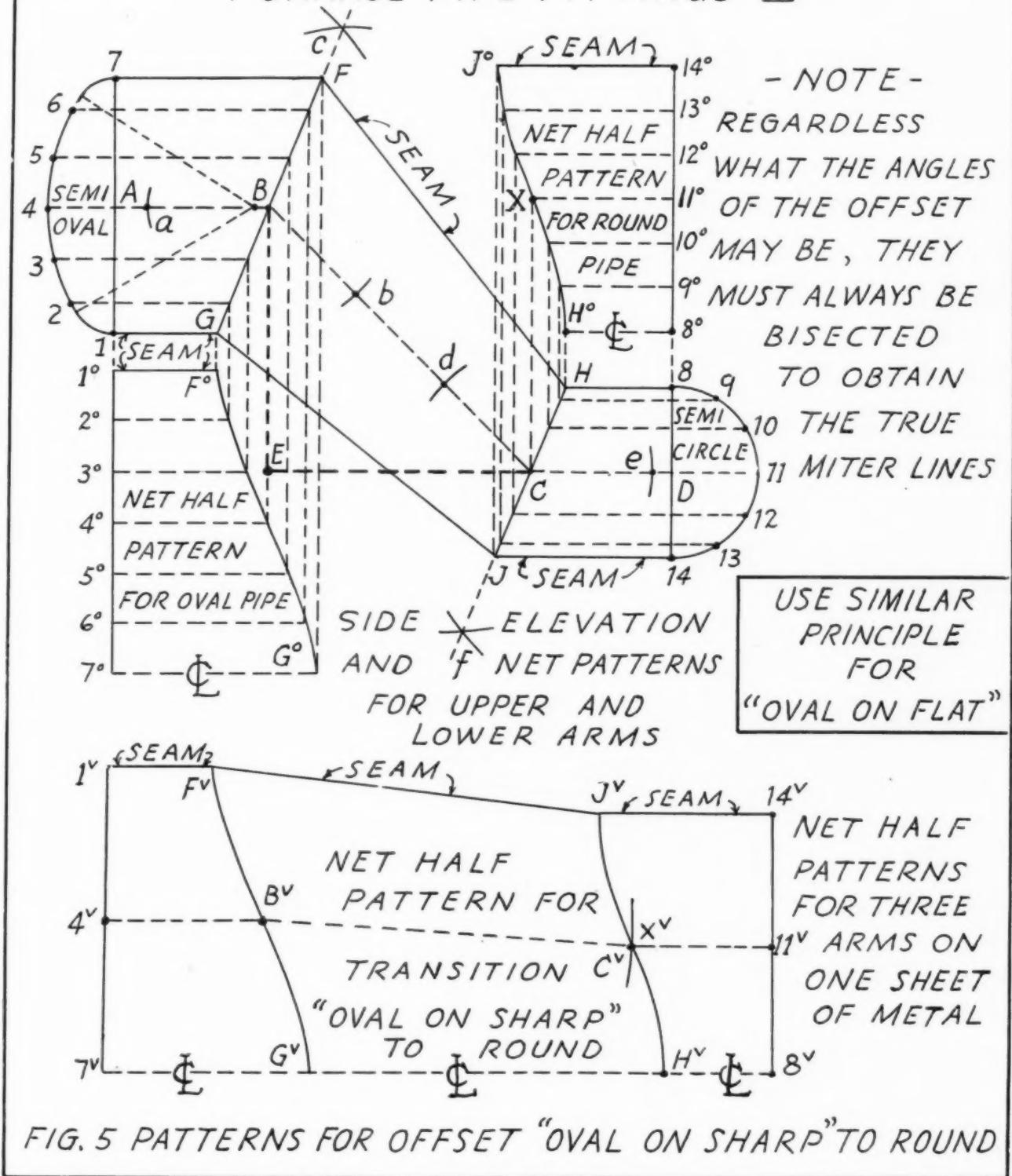
A SHORT METHOD of developing a single three-pieced offset "oval on sharp" to round is shown in Fig. 5. The oval and round pieces will be developed by parallel lines which are geometrically correct and the middle piece forming a transition from "oval on sharp" to round will be laid out by an approximate method which is not geometrically correct but is accurate enough for all practical work. Using this short rule, triangulation is not necessary.

First, draw the center line of the offset to given dimensions as shown in the side elevation by *A-B-C-D*, having the required drop *B-E* and offset *E-C*. On either side of *A* lay off the semi-length of the oval as shown by *I* and *7* and draw the desired semi-oval as shown. On either side of *D* lay off the half diameter of the semi-circle as shown by *8* and *14* and describe the semi-circle as shown. Bisect the angle *A-B-C* so as to obtain the true miter line as follows: With *B* as a center, and any radius draw short arcs to intersect the center line at *a* and *b*. With the same or any other radius using *a* and *b* as centers, intersect arcs at *c*. Draw the miter line from *c* through *B* indefinitely.

In a similar manner bisect the angle *B-C-D*, by the arcs *d*, *e* and *f*. From *f* draw the miter line through *C* indefinitely. From points *I* and *7* on the upper arm in side elevation draw horizontal lines to intersect the miter line at *G* and *F*. From points *8* and *14* on the lower arm, draw horizontal lines to intersect the miter line at *H* and *J*. Divide the semi-oval in equal divisions as indicated from *2* to *6*, from which points draw horizontal lines to intersect the miter line *F-G* as shown. In similar manner divide the semi-circle in equal divisions as indicated from *9* to *13*, and from these points draw horizontal lines to intersect the miter line *H-J* as shown. Now take the girth of the semi-oval *I* to *7* and place it on the vertical line *I°-7°* as shown by similar numbers. From these

divisions *I°* to *7°* draw horizontal lines and intersect them, by vertical lines drawn from corresponding intersections on the miter line *F-G*. Trace a curved line through points so obtained, then will *I°-F°-G°-7°* be the one half net pattern for the oval pipe with seam along *I-G* in side elevation. In a similar manner develop the one half net pattern for the round pipe. Place the girth of the semi-circle *8* to *14* on the line *8°-14°* shown above, by similar numbers. Draw the usual horizontal measuring lines and intersect them by vertical lines erected from corresponding points on the miter line *H-J*. Trace a line through points so obtained then will *H°-J°-14°-8°* be the one half net pattern for the round pipe with seam along *J-14* in side elevation. From these two geometrically correct half patterns, the approximately half pattern for the middle or transition piece of the offset is obtained, as follows: Take a tracing of the half pattern for oval pipe and place it as shown below by similar numbers. From the center of this traced pattern as *4°* draw a horizontal line to intersect the miter cut *F°-G°* at *B°*. Now take the length of the center line *B-C* in side elevation as radius and using *B°* in the transition pattern as a center, describe a short arc near *C°*. Now take a tracing of the half pattern for round pipe and set it in the position shown in the transition pattern, as indicated by similar numbers, being careful that the intersection *X* in the round pipe pattern, intersects the arc *C°* in the transition pattern at *X°* and that the line *H°-8°* will be on the line *7°-G°* extended and that the line *8°-14°* will be perpendicular. Now draw a line from *F°* to *J°*. Then *F°-J°-H°-G°-F°* will be the one half net approximate pattern for the transition "oval on sharp" to round. Allowance must be made for seaming and riveting on all three pattern shapes. C. L. on all patterns indicate the center lines on which the half patterns are reversed for full pattern shapes.

- FURNACE PIPE FITTINGS -III-



OPEN



DISCUSSION

Readers having had experience with the problems under discussion are invited to submit their ideas.

Back-Draft and Condensation

By L. V. Clark,
Rightway Appliance Co., Lodi, Wisc.

BACK-DRAFT and condensation are highly controversial subjects, with opinions on their causes almost as many and varied as the chimneys in which they exist. However, if we accept the axiom that the laws of nature are inflexible, there must be definite rules by which we can solve these

problems. While back-draft and condensation are related subjects, it is definitely possible to have either one without having the other.

Why Back-Draft?

Because back-draft is a problem in itself as well as a contributing factor in condensation, it will perhaps be better to consider it first. Draft is commonly accepted as a column of air flowing from a high pressure area to a low pressure area. (Fig. 1) This condition can be induced by heat, by the siphoning effect of a wind passing over a chimney properly or by mechanical means such as fans, etc.

It is well known that back-drafts are caused by overhanging or adjacent trees, nearby buildings and hills, etc. (Fig. 2) the ridge of the same building if above the top of the chimney. The common cause of a back-draft, which should not be confused with a lack of draft, is wind interference. One must bear in mind, however, that a lack of draft is often the only indication of an actual back-draft. The wind may be diverted either by the bottom of the column of air dragging on some obstruction to its natural course, causing

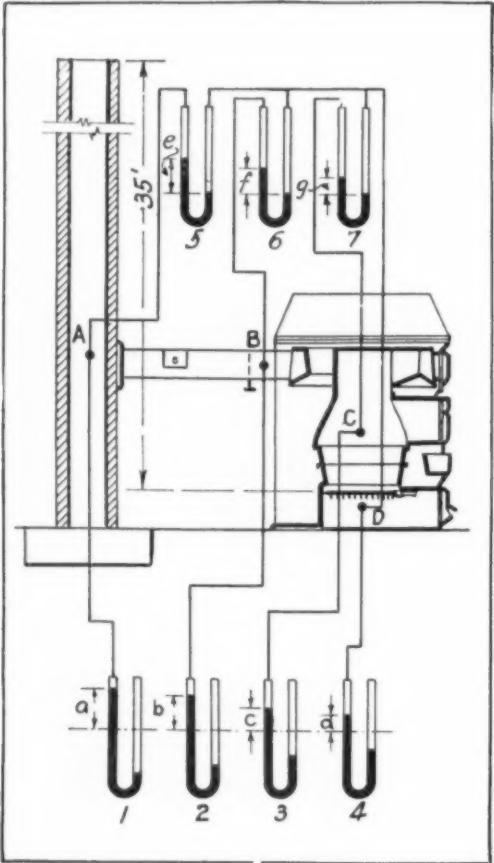


Fig. 1—The above diagram shows the relative intensity of draft in the four critical locations at which draft is usually determined in making furnace or chimney checks on adequate draft (designated A, B, C, D).

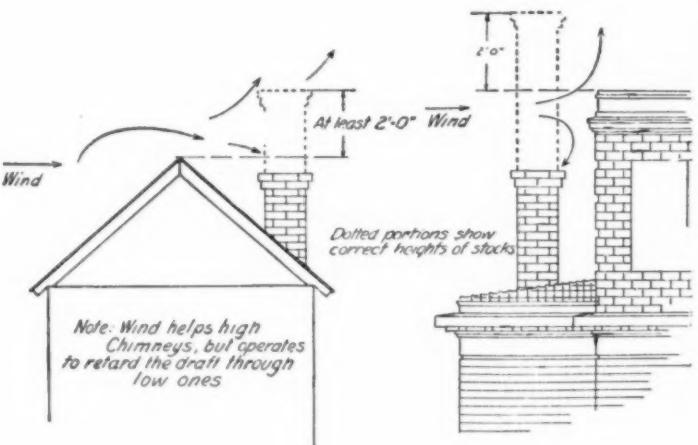


Fig. 2—Backdraft caused by incorrect height of chimneys. Dotted lines show proper heights.

it to curve downward or by the column of air colliding with an object, an overhanging tree or building, (Fig. 2), which guides it down the chimney, providing it has the necessary force to overcome the existing resistance. Another less known cause is wind striking the flat side of a building or some other similar obstruction, down wind from the chimney involved, in such a way that it builds up a small high pressure area which includes the top of the chimney.

In the case of a fireplace, stove or space heater, it can happen that the wind blows with a syphoning effect past the open window of the room venting into the chimney involved, thus inducing a low pressure area within the room. This causes the chimney to flow backwards. Closing the window often stops the syphoning effect of the wind. Usually, a siphon cap on the chimney, extended above any possible high pressure area, will allow the windows to be opened or closed according to the desires of the occupants of the building. However, if the syphoning effect is too great past an open window, unless the window could remain closed, the only alternative would be to resort to mechanical means for correction.

Heat Solves the Problem

Many cases of back-draft are solved unknowingly, by al-

Flue temp. at collar Degrees.	Average temp. in chimney Degrees	Draft per foot of flue height in inches of water			
		Outside Temperature			
		At 0 Deg.	At 30 Deg.	At 50 Deg.	At 70 Deg.
300	100	.00216	.00114	.00053	.00009
450	200		.00333	.00292	
500	200	.00435	.00345	.00280	.00255
650	300	.00580	.00494	.00433	.00380
700	300	.00596	.00500	.00450	.00385
800	400	.00680	.00600	.00540	.00500
650	400	.00700	.00618	.00557	.00515
900	400	.00720	.00630	.00570	.00525

Fig. 3—Table showing the amount of draft per foot of flue height which should be available in a good chimney at different flue temperatures and different outdoor temperatures—for coal.

lowing more heat from the heating plant to enter the chimney. This causes the air entering the chimney to expand faster and overcome the resistance (Fig. 3). Inversely, checking the draft to increase the efficiency of a heating plant will cause a back-draft to appear where none seemed to exist before. Using heat to overcome a back-draft is a costly and inefficient way to accomplish this purpose (Fig. 4). Some form of fan might better be used to overcome such back-drafts. The drawback to a fan is the cost of installation, operation and upkeep. Draft diverters exhausting within the building would hardly seem a proper solution except perhaps where gas is used for fuel.

This brings us to the question of what is the practical and efficient method of preventing back-drafts. Probably the answer is some form of a siphon cap (Fig. 5) installed high enough to be above any possible high pressure area. After all, the majority of chimney caps, from the masonry cap, through the wide variety of "rain caps," the revolving caps and the turbines to the most intricate of the siphon caps, are all siphon caps or combined siphon caps and wind driven fans. Each and every one will cure some case or cases of back-draft trouble.

Because of the wide variation in cap efficiencies, the installer should try to choose a cap that has sufficient siphoning action to produce enough draft to provide air enough for maximum efficiency in the heating device. Too, thought should be given

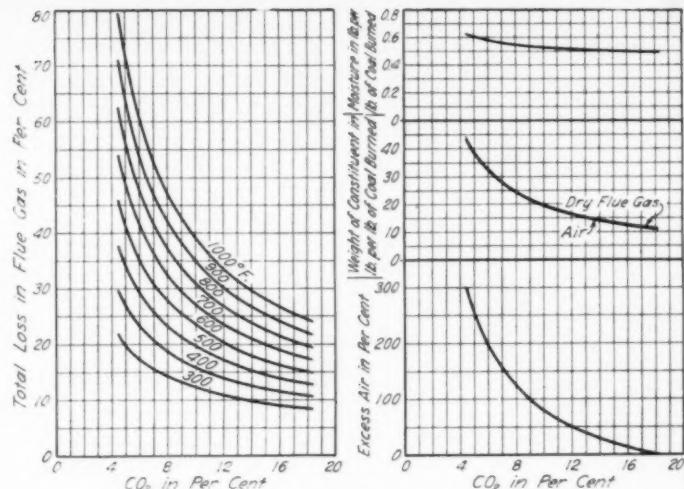
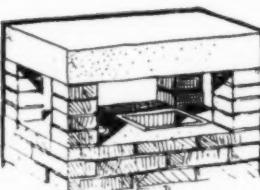


Fig. 4—Flue gas losses with medium-volatile bituminous coal as fuel.

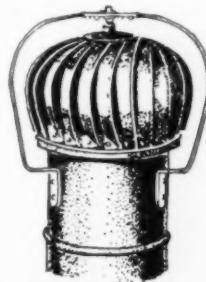
to the amount of service, if any, that each cap requires to keep it operating properly. A revolving cap stuck with the opening facing the wind will act as a scoop with obvious results. Although cost may be a factor in determining the model or make, a well designed cap of the true siphoning type should be the correct answer. This type may create too strong a draft at times and, for that reason require the installation of a draft regulator if none existed previously. The increased efficiency would undoubtedly compensate for the added cost.

What Is Condensation?

If a chimney is properly protected from back-draft as outlined above, there should be no condensation in the majority of cases. But before we enter into the subject of condensa-



STONE OR CONCRETE CHIMNEY TOP



TURBINE-TYPE ROTATING TOP



ROTATING METAL CHIMNEY TOP



METAL OR ASBESTOS CONE-TYPE TOP

Fig. 5—Several popular types of siphon caps for chimneys.

Sq.Ft. of grate in furnace	Lbs. coal at 5 lbs. per hr.	Inches Draft req'd at 5 lb. rate	Lbs. Coal at 3 lbs. per hr.	Inches Draft req'd at 3 lbs. per hr.	Height of Chimney above Grate		
					26 ft.	30 ft.	40 ft.
					Draft of Chimney in Inches of Water at an assumed temp. of 300 degrees		
					.155	.179	.238
				minimum inside size of chimney			
1.22	6.1	.177	3.6	.151	8x8	8x8	
1.97	9.8	.189	5.9	.154	8x8	8x8	
2.64	13.2	.192	8.	.158	8x8	9x12	
3.1"	15.8	.195	9.5	.162	8x8	9x12	

tion it may be well to stop and consider where condensation comes from and how it becomes condensation. Cresote is con- sation with the by-products of combustion and improper combustion in solution. (Note: I have succeeded in making condensation run clear i.e. pure water, in tests which I have conducted. Author.)

Since condensation is water the question appears to be, "Where does the water come from?" It cannot be argued that rain is the chief factor until someone can explain why it should rain down the chimney on one end of a house and not down a chimney on the other end. It is true that rain can be and probably is, a contributing factor, but nothing more. Another complicating thing that enters into the apparent causes and effects, is the ability of some chimneys to absorb more moisture than others.

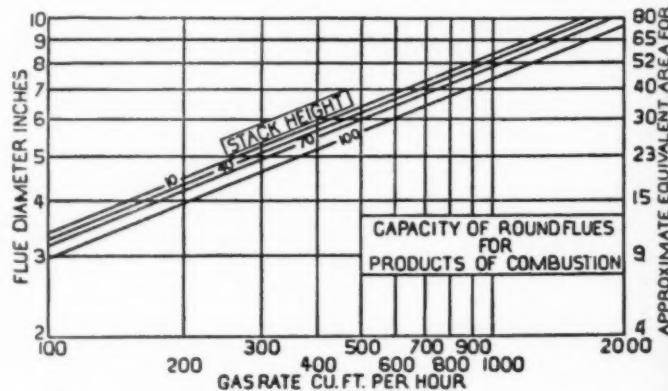
There is a certain amount of moisture in practically all fuels. There is moisture in the air that enters into the heating device. Upon contact with enough heat it becomes steam and starts out the stack with the flue gases. Hydrogen from the fuel and oxygen from the air, combine in the fire to form H_2O and it too, starts out the stack as steam. Incidentally, this accounts for the white vapors that are seen leaving the chimney on a cold day, particularly where fuel oil is burned. If this steam passes out from the top of the chimney, all is well and good. If not, we have the well known result, condensation.

Now the question is, "Why does this steam condense?" The amount of moisture that can be retained by air depends on the temperature and rate of travel of the air. If either the temperature or speed of the air is reduced the other one would have to be increased to enable the air to hold the same amount of moisture. This combination of air speed and temperature is sometimes spoken of as the "dew-point." The humidity of the atmosphere is also a factor. Therefore, we find that our problem is how to keep the air leaving the chimney above the "dew-point." Obviously, we do not wish to allow any more heat than necessary to pass out the stack. Neither do we wish to draw any excess air through a fire as this decreases efficiency.

Some Common Dangers

In many cases, increasing the efficiency of a heating device by correcting the draft, has caused a chimney to run condensation that had never done so previously. Many dealers have run into trouble by installing equipment with a higher overall efficiency than the previous equipment. Their equipment was blamed because "that chimney never did that before." It never occurred to either the customer or the dealer that it was the absence of wasted heat that caused the condensation. It should, perhaps, be stated right here that it is necessary to allow a certain amount of heat to pass through the chimney in order to keep it in the proper condition. The most efficient

The tables presented here are useful in calculating the size furnace that must be used in conjunction with an installed chimney. They make draft gauges practically unnecessary.



condition is one in which the proper amount of air for maximum efficiency in the heating device is passed through the heater and out through the chimney at the necessary temperature to keep the flue gases above the "dew-point." Even a momentary interference with the passage of the flue gases through the chimney can cause condensation. While the chimney will absorb a certain amount of moisture, a good syphon cap may correct this trouble.

We still have the problem of too low flue gas temperature as a cause of condensation. The old idea was that a chimney couldn't be too big. Many chimneys are still being built on that theory. Many cases of condensation have been cured by the simple means of blocking off part of the chimney area at the top either with a piece of sheet metal and a masonry cap or some similar method. However, a better solution is to run a smaller flue down a large chimney in order to get the proper combination. For coal burning furnaces minimum flue areas at different chimney heights are shown in Fig. 6. Fig. 7 shows areas for gas.

In some cases, particularly heating and cooking stoves, where the smoke pipes run through an unheated room before entering the chimney, it may be necessary to cover the pipes with insulation to prevent heat loss in the flue gases. Many metal chimney extensions have been replaced with a double pipe to give a dead air space around the inner pipe for the same reason.

In cases where condensation is encountered, the first step should be to install a syphon cap, the more efficient the better, of no larger size than necessary to provide the proper flue area for the equipment connected to that chimney. Then if needed, insulate all pipes exposed to lower than room temperatures. Then if trouble is still experienced and the area of the chimney is larger than necessary, reduce the flue area by some approved method.

In conclusion, the proper solution to all of these problems can best be arrived at by the proper use of reliable draft test equipment.

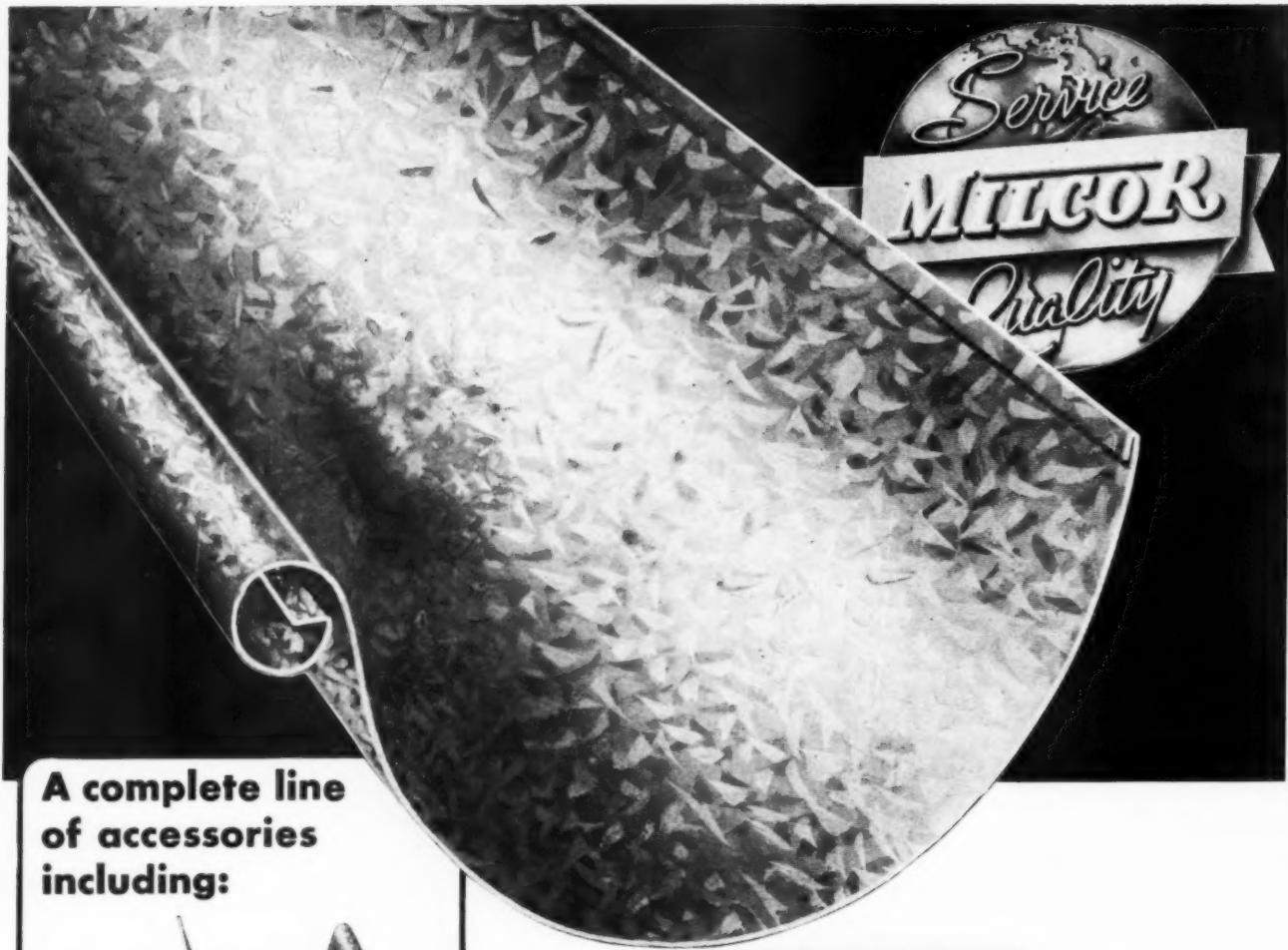
AMERICAN ARTISAN

SHEET METAL

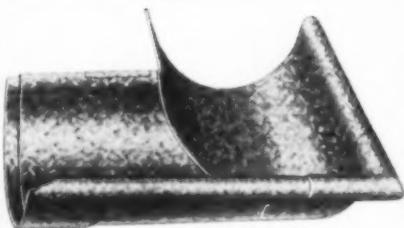
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Fundamentals Of Roof Drainage

A discussion of the design of roof drainage systems with useful tables which may be used to simplify drainage calculations.

THE ideal roof drainage system is one which will carry away the water shed by the roof most efficiently, carrying the water to sewers and designed and installed so it will not become a storage place for water. Gutters and leaders should be sized to carry away the maximum amount of water which may fall on the roof, but should not be oversized as this leads to other difficulties.

The most common faults of roof drainage systems are:

1. Gutters too small
2. Outlets too small or of improper shape
3. Too few or improperly spaced downspouts
4. Expansion and contraction not taken into account
5. Absence of scuppers or overflow drains
6. Inadequate provision for accumulation of ice and snow.

To solve the basic problems of roof drainage, two factors must be considered: (1) The greatest amount of rainfall the roof will be required to take care of (but not necessarily the

extra heavy rain which comes once in ten to twenty years) and (2) the actual area of the roof to be drained.

Generally speaking, a common rule for downspout size is: one square inch of downspout area for each 100 square feet of roof area to be drained by that downspout.

To determine the amount of rainfall the roof may be required to take care of, certain basic rainfall data are available. This data is shown in Table 1 for selected cities in various areas of the country.

Having determined the rainfall data from Table 1, check the result with these suggestions:

- (a) A 3-inch round or 1 $\frac{1}{4}$ by 2 $\frac{1}{4}$ -inch downspout should be the minimum except, perhaps, for a very small porch;
- (b) The area of the downspout should be uniform throughout (don't have larger or smaller, elbows, offsets, angles, etc.);

TABLE 1.

	(A) STORMS WHICH SHOULD BE EXCEEDED ONLY ONCE IN 5 YEARS		(B) STORMS WHICH SHOULD BE EXCEEDED ONLY ONCE IN 10 YEARS		(C) MAXIMUM RECORDED STORMS	
	Intensity in Ins/Hr. Lasting 5 Minutes	Sq. Ft. of Actual Roof Drained per Sq. In. of Leader Area	Intensity in Ins/Hr. Lasting 5 Minutes	Sq. Ft. of Actual Roof Drained per Sq. In. of Leader Area	Intensity in Ins/Hr. Lasting 5 Minutes	Sq. Ft. of Actual Roof Drained per Sq. In. of Leader
Albany.....	6	200	7	175	7	175
Atlanta.....	7	175	7	175	9	130
Boston.....	5	240	6	200	7	175
Buffalo.....	5	240	5	240	10	120
Chicago.....	6	200	7	175	7	175
Detroit.....	6	200	6	200	7	175
Duluth.....	5	240	6	200	7	175
Kansas City.....	7	175	8	150	10	120
Knoxville.....	5	240	6	200	6	200
Louisville.....	6	200	7	175	8	150
Memphis.....	5	240	6	200	10	120
Montgomery.....	7	175	7	175	7	175
New Orleans.....	7	175	7	175	8	150
New York City.....	6	200	8	150	9	130
Norfolk.....	6	200	7	175	8	150
Philadelphia.....	6	200	7	175	8	150
Pittsburgh.....	6	200	6	200	7	175
St. Louis.....	6	200	8	150	11	110
St. Paul.....	6	200	6	200	8	150
San Francisco.....	2	600	2	600	3	400
Savannah.....	6	200	7	175	8	150
Seattle.....	2	600	2	600	2	600
Washington.....	6	200	7	175	8	150

TYPE	AREA IN Sq. IN.	NOMINAL LEADER SIZES
Plain Round	7.07	3"
	12.57	4"
	19.63	5"
	28.27	6"
Corrugated Round	5.94	3"
	11.04	4"
	17.72	5"
	25.97	6"
Polygon Octagonal	6.36	3"
	11.30	4"
	17.65	5"
	25.40	6"
Square Corrugated	3.80	1 $\frac{3}{4}$ " x 2 $\frac{1}{4}$ " (2")
	7.73	2 $\frac{3}{8}$ " x 3 $\frac{1}{4}$ " (3")
	11.70	2 $\frac{3}{4}$ " x 4 $\frac{1}{4}$ " (4")
	18.75	3 $\frac{3}{4}$ " x 5" (5")
Plain Rectangular	3.94	1 $\frac{3}{4}$ " x 2 $\frac{1}{4}$ "
	6.00	2" x 3"
	8.00	2" x 4"
	12.00	3" x 4"
	20.00	4" x 5"
	24.00	4" x 6"

TABLE 2.

- (c) Don't have more than 75 feet between downspouts;
- (d) If possible place downspouts at corners of the building so the water will not have to turn sharp corners;
- (e) Be sure to use the actual area of the roof and not the area shown on plans.

Having found from Table 1 the amount of roof area which 1 square inch of downspout will serve, use Table 2 to determine the nearest commercial size for various types of downspouts.

If, as suggested under (e) above, it is not possible to actually measure the area of the roof since all that is available is an architect's plan, the actual area of the roof can be determined from the area of the foundation or the ground area under the roof by using Table 3 (from James McCawley's book "Roofing").

Example

Suppose a ranch type house without "els" must be drained. The roof is plain, with a ridge running the length of the house and 6 feet higher than the eaves. The house is located in Kansas City. The house is 44 feet long across the front and 24 feet from front to back.

Procedure: From Table 3 it is found that a roof rising 6 feet from eave to ridge with the ridge 12 feet from the eave is equal to 6 inches rise per foot horizontal. This shows in Table 3, line 12, in classification "Steep Roofs" (Table 3) as a 26°—34' angle with the horizontal; or as a "1/4 Fractional Factor"; with an "Inclined area per Sq. Ft. Horizontal Area" of 1.118; or with a "Percentage Increase in Area Over Flat Roof" of 11.8 per cent.

Since this roof measuring 44 feet by 24 feet on the flat on the ground has an actual area as built of $44 \times 24 = 1056$ sq. ft. plus 11.8 per cent = 1180 sq. ft.

From Table 1 Kansas City shows (under Section B) 150 is the amount of roof area which 1 sq. in. of downspout will serve. Our ranch type house with two roof pitches will probably have one downspout at each corner (total 4) so 1180 sq. ft. of roof divided by 4 equals 295 sq. ft. of roof to be served by each downspout. Therefore a 295 sq. ft. area should have $295 \div 150 = 2$ approx. But we do not use a smaller than 3-inch downspout.

If the mathematics are more complicated use Table 2 to find the downspout area required.

Gutter Area

To find the size of gutter required, Table 1, Column 3 shows "Intensity in Ins. per Hr. Lasting 5 Minutes." For Kansas City this intensity is given as 8. With an "Intensity of 8 and an area of 295 sq. ft. draining into each downspout Chart A shows a 5-inch semi-circular Level Roof Gutter required.

To find the size of a rectangular gutter a complicated mathematical formula can be used, but a simpler method is to use two charts suggested by Copper & Brass Research Association on which the formula has been plotted.

Good practice suggests a rectangular gutter with a depth of $\frac{1}{2}$ and not more than $\frac{3}{4}$ of its width— $\frac{1}{2}$ is recommended. On the ranch type house in Kansas City with a 44-foot front and two corner downspouts the gutter will serve 22 feet of the roof length.

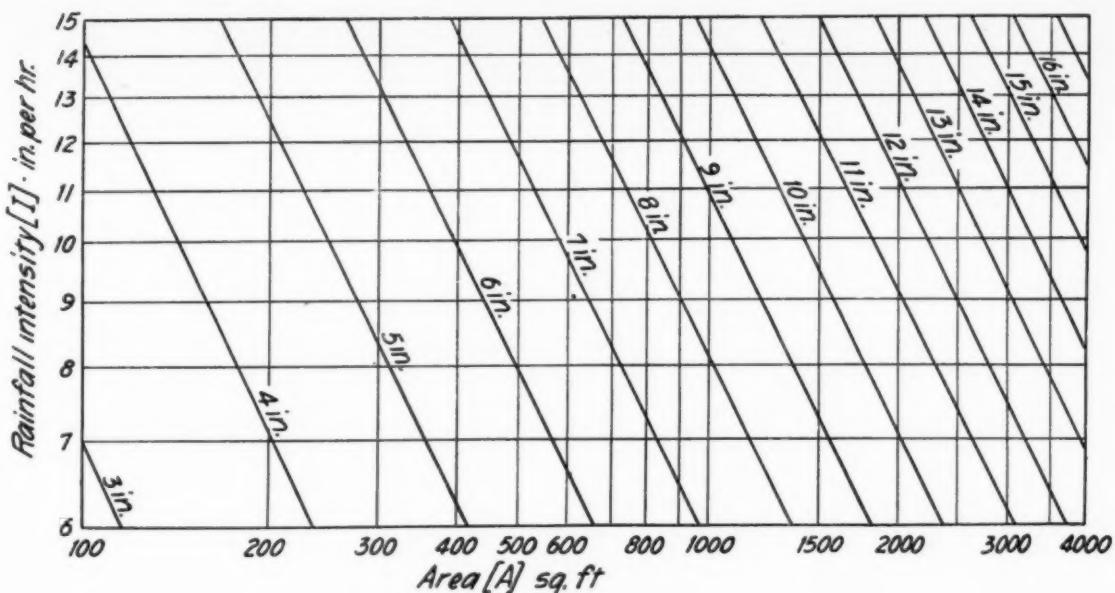
Again, Table 1 shows that the "Intensity" of rainfall in Kansas City (Column 3) is 8 inches per hour. The gutter has a depth equal to $\frac{1}{2}$ the width or a ratio of 0.5. On Chart 1 locate length of gutter (22 feet) across the bottom and move upward to the diagonal line representing a ratio of 0.5. Move left and read N = 22.

Now use Chart 2 as follows: The rainfall "Intensity" for Kansas City is 8 inches per hour times the area of the roof to be drained by the gutter equals $8 \times 295 = 2360$. "N" determined above equals 22. Locate 22 across the bottom of Chart 2 and move upward to the intersection of the 2360 horizontal line. This intersection falls between 4 and 5 inch rectangular gutter width and closer to the 4 than to the 5. Either 4-inch or 5-inch gutter width will probably be satisfactory, but a 5-inch width is probably preferred.

TABLE 3.

THIS TABLE SHOWS THE RISE OR INCLINE OF ROOFS IN INCHES; DEGREES AND FRACTIONS PER FOOT. IT ALSO INDICATES THE INCREASED AREA PER SQ. FT. OF STEEP ROOFS OVER FLAT ROOFS.

Classification	Incline			Inclined Area Per Sq. Foot Horizontal Area	Percentage Increase in Area Over Flat Roof
	Inch Per Foot Horizontal	Angle With Horizontal	Fractional Factor		
Flat Roofs	$\frac{1}{8}$	0°-36'		1.000	0.0
	$\frac{1}{4}$	1°-12'		1.000	0.0
	$\frac{3}{8}$	1°-47'		1.000	0.0
	$\frac{1}{2}$	2°-23'	$\frac{1}{48}$	1.001	0.1
	$\frac{5}{8}$	2°-59'		1.001	0.1
	$\frac{3}{4}$	3°-35'	$\frac{1}{32}$	1.002	0.2
	1	4°-46'	$\frac{1}{24}$	1.003	0.3
	$\frac{1}{6}$	5°-21'		1.004	0.4
	$\frac{1}{4}$	5°-57'		1.005	0.5
	$\frac{1}{2}$	7°-8'	$\frac{1}{16}$	1.008	0.8
Steep Roofs	$\frac{1}{4}$	8°-18'		1.011	1.1
	2	9°-28'	$\frac{1}{12}$	1.014	1.4
	$2\frac{1}{4}$	10°-37'		1.017	1.7
	$2\frac{1}{2}$	11°-46'		1.021	2.1
	$2\frac{3}{4}$	12°-54'		1.026	2.6
	3	14°-2'	$\frac{1}{8}$	1.031	3.1
	$3\frac{1}{4}$	15°-9'		1.036	3.6
	$3\frac{1}{2}$	16°-16'		1.042	4.2
	$3\frac{3}{4}$	17°-21'		1.048	4.8
	4	18°-26'	$\frac{1}{6}$	1.054	5.4
Extra Steep Roofs	$4\frac{1}{4}$	19°-30'		1.061	6.1
	$4\frac{1}{2}$	20°-34'		1.068	6.8
	5	22°-37'		1.083	8.3
	6	26°-34'	$\frac{1}{4}$	1.118	11.8
	7	30°-16'		1.158	15.8
	8	33°-42'	$\frac{1}{3}$	1.202	20.2
	9	36°-52'		1.250	25.0
	10	39°-48'		1.302	30.2
	11	42°-31'		1.356	35.6
	12	45°-0'	$\frac{1}{2}$	1.414	41.4
Extra Steep Roofs	14	49°-24'		1.537	53.7
	16	53°-8'		1.667	66.7
	18	56°-19'		1.803	80.3
	20	59°-2'		1.943	94.3
	22	61°-23'		2.088	108.8
	24	63°-26'	1	2.235	123.5



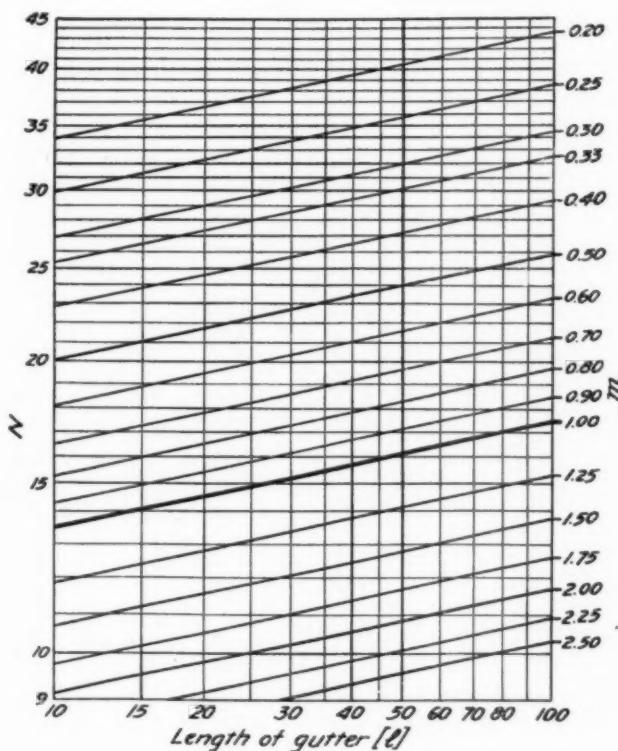
*Semi-circular Level Roof Gutters
Width of gutter required for given roof areas
and rainfall intensities.*

Chart A

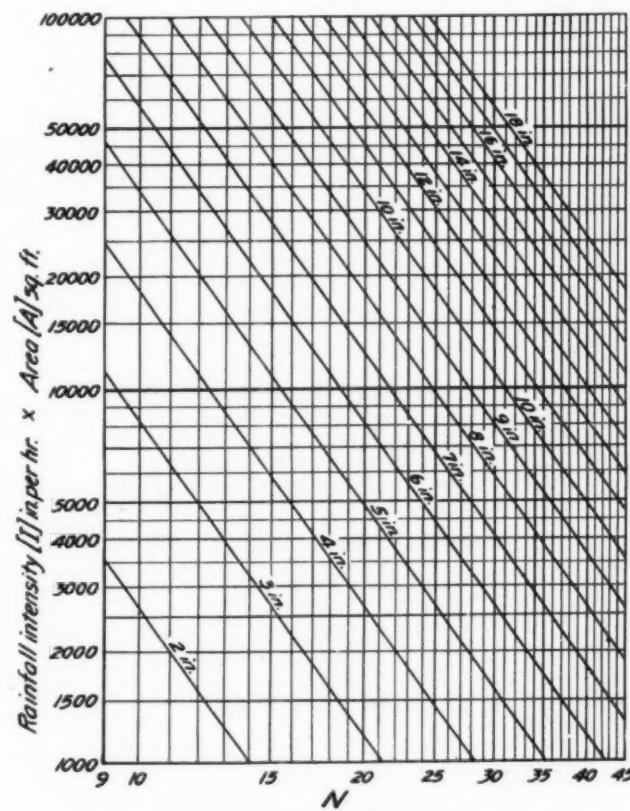
In the case of houses with "els" or houses with broken roofs it is suggested that the roof be divided into units. How to determine a unit depends on where downspouts can be placed. With downspout locations decided upon and roof units

thereby also determined, proceed as in the plain roof described previously.

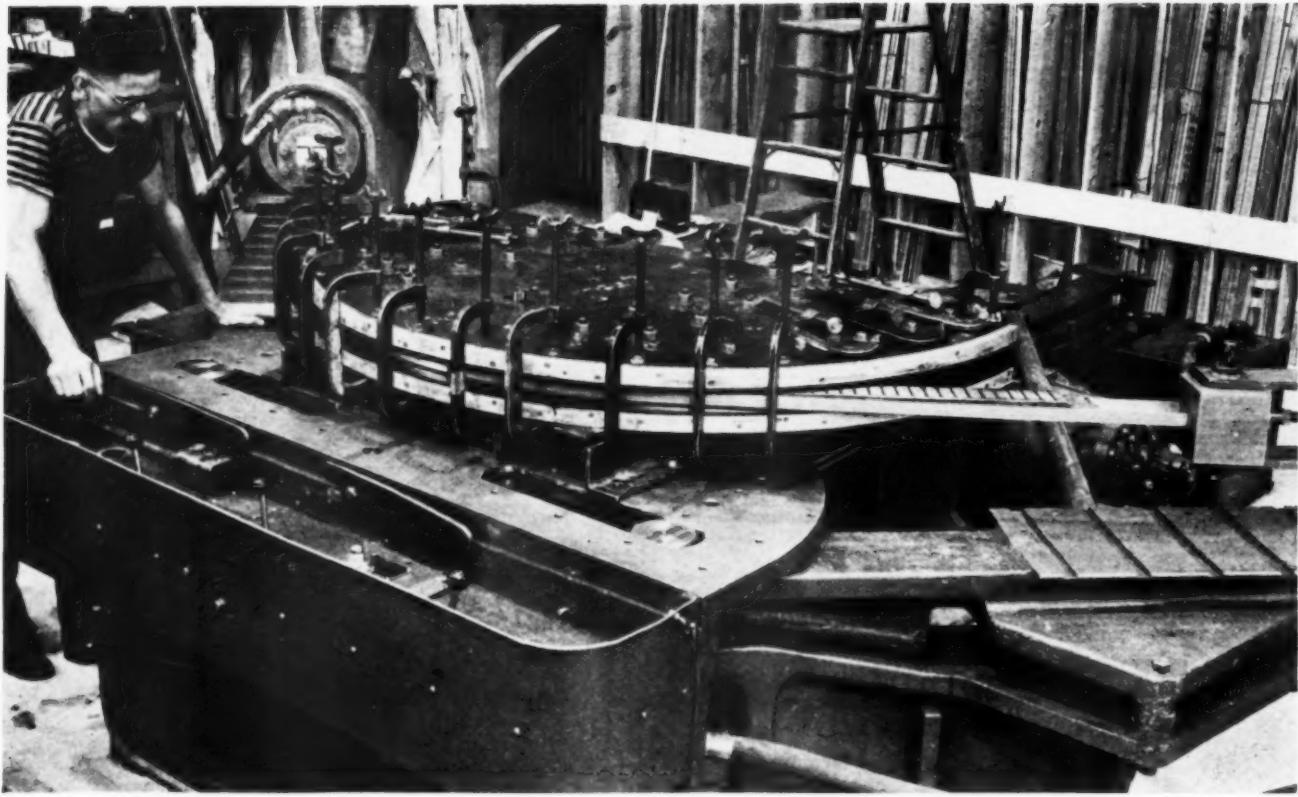
For flat roofs and very steep roofs the procedure is the same excepting other sections of Table 3 are used.



*Chart 1
Rectangular Level Roof Gutters
Width of Gutter required for given roof areas and
rainfall intensities. See also Chart 2.
The quantity [m] gives the proportions of the cross-
section. m = depth of gutter divided by width of gutter.*



*Chart 2
Rectangular Level Roof Gutters
Width of gutter required for given roof
areas and rainfall intensities.*



Contour Forming by Stretching

By Frank B. Howe

HYDRAULIC stretch forming, born into the aviation industry during the war, is now invading peacetime metal working factories at a speed limited only by the time it takes the various enterprises to discover its numerous advantages. Stretch forming of preformed sheet metal sections and extrusions to contour, originally created to speed the production of airplanes, which largely are made up of curved surfaces, now extends to almost everything from busses to window sash.

Production is Rapid

With the stretch forming machine, contouring and beveling can be accomplished in a single operation. Parts are produced in from less than a minute to a maximum of three minutes and practically all of the hand work and degreasing required by conventional methods is eliminated. By changing to stretch forming, the aircraft manufacturers who used it increased production of extruded parts by as much as 300 per cent while reducing manpower 30 per cent.

Extrusions, rolled stock and narrow sheet stock of any type of ductile metal can be handled by the machine and through the elimination of hand work, an especially high degree of precision and uniformity is achieved.

Construction of Machine

The machine consists, first, of a central stationary table on which is mounted the form block, or die. Dies can be made directly from engineering drawing or to template. For low production runs, these dies can even be made from Masonite

which can be worked with ordinary wood-working equipment. These two factors obviously greatly reduce the usual tooling costs.

On either side of the central table are arms which are simultaneously actuated by a hydraulic cylinder. On each arm is a hydraulic tension cylinder which can be moved along the arm and locked wherever desired, according to the length of the material being worked. Pneumatic jaws which accommodate interchangeable inserts of any desired shape, depending on the work being done, are mounted before each of the tension cylinders.

The material to be contoured is gripped at each end by the jaws, then stretched to a point slightly below its elastic limit. The arms then are set in motion and wrap the metal around the die, bending and beveling simultaneously. Since the material is under equal tension at all points before forming, it contacts the die with equal pressure throughout.

Wrinkling is thus eliminated and spring back either eliminated altogether or rendered so slight that a minor change in the die will compensate for it. Work hardening is slight and evenly distributed. Once the proper stretching and bending pressures for a part are determined, uniform parts can be produced at a high rate of speed with great accuracy. Fifty parts per hour, floor to floor time, are not uncommon.

Peacetime Uses

The bus builders were the first to follow the aviation people in adopting stretch forming after the war and are using it in

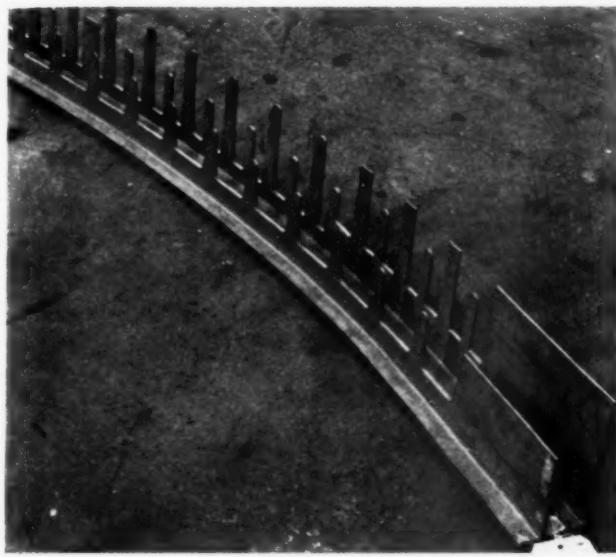


Fig. 1—A large channel extrusion with finger cutouts, formed without canting.

a big way. Window sash; parts for small boats such as gunwales, ribs and keels; all sorts of railroad car parts; escalator parts; metal molding and trim—these are a few of the other curved and contoured metal parts which have yielded to stretch forming during the past few months.

A. H. Peterson, production methods department engineer of Lockheed Aircraft Corporation, who has developed the use of stretch forming exhaustively, thus comments on his experience with the process:

"As the bulk of airplane parts are designed with curved surfaces, it was mandatory that economical forming methods be developed to produce these designs. For such parts as channels, angles, hat sections, etc., having a uniform cross section throughout the length, stretch forming solved many difficult problems. These various types of sheet metal shapes may be stretched to variable contour or to a true radius, but care must be taken that the designed curvature does not exceed the allowable elongation limits of the metal."

"Angles may be readily formed to constant or variable contours. Also, a variable angular degree may be included

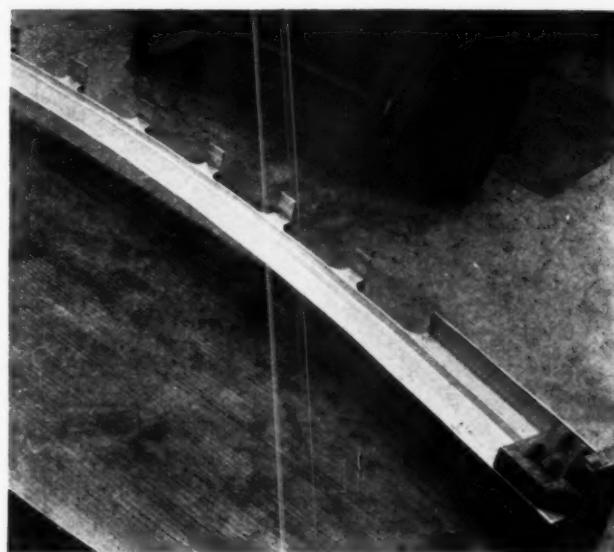


Fig. 2—An example of the symmetrical forming done to a heavy extrusion, a wing cap member, though large cutouts were made before forming.

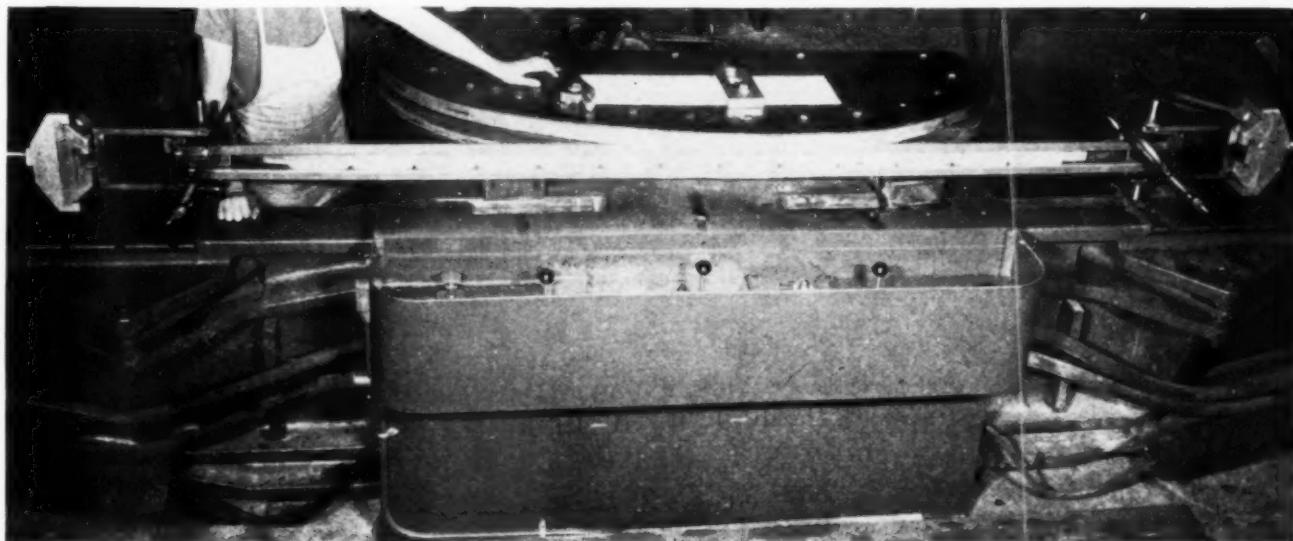
in this type of design, but must be pre-formed into the straight angle before stretching.

"Sections that are not fully supported by the die must have auxiliary filler bars to achieve proper backing. The hat section (Fig. 3) has a chain type filler strip to support the sides of the part while being contoured. It is necessary to maintain a very tight fit between the form block, part and flexible filler strip to prevent the sides of the sections from distorting.

"Stainless steels, including $\frac{1}{4}H$ and $\frac{1}{2}H$ are very adaptable to contouring by stretching. There is no other known forming method that can equal the economy, quality of workmanship or versatility of stretch forming pre-formed sheet metal sections to contour in this harder material." (The illustration on Page 82 shows a $304\frac{1}{4}H$ stainless steel channel of .040 metal \times 1 inch flanges \times 3 inch web in process of being stretch formed to a 30 inch outside radius for an arc of 180° . A flexible filler strip is used on the inside of the channel to prevent the outer flange and web from collapsing.)

"Some parts may be stretch formed from flat blanks without first pre-forming to shape such as the stabilizer cap sec-

Fig. 3—A hat section is shown, preparatory to contouring, with a clear view of the chain filler that is used to prevent distortion in the bending process.



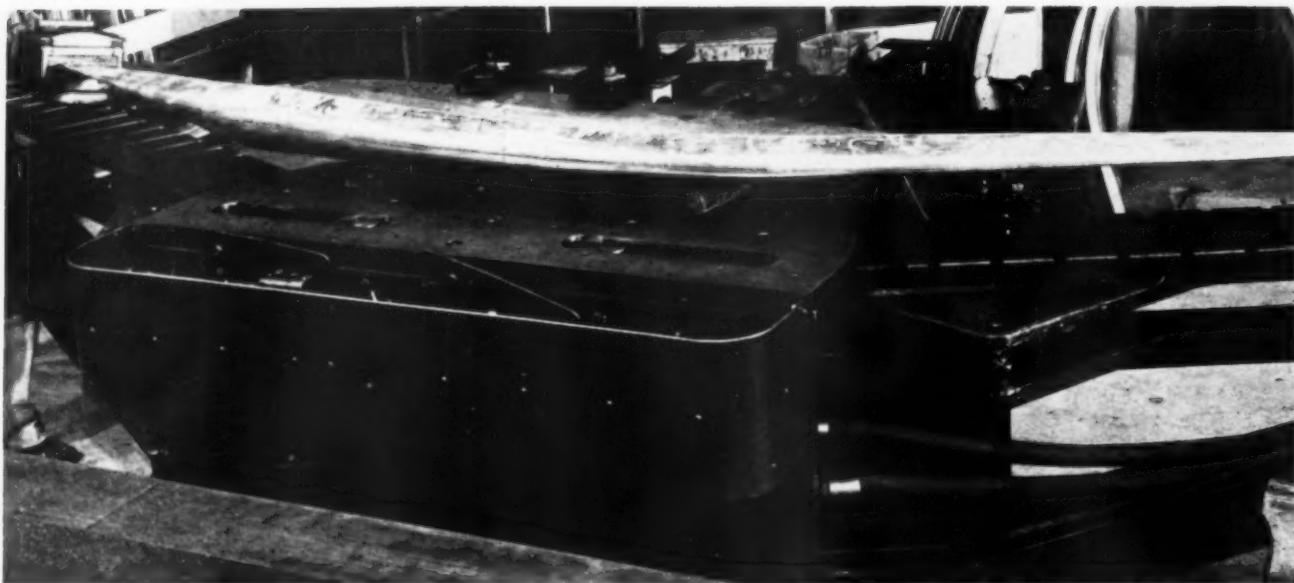


Fig. 4—A stabilizer cap section which is stretch formed without any need of preforming. The process has greatly facilitated the production of work of this type.

tion (Fig. 4). The flat blank is folded over at each end and inserted into the clamp jaws. The metal tends to 'flow' to the shape of the die when proper tension is applied. On large caps, the part is partially stretched to contour in the annealed condition, and then finished stretched after heat treatment while the metal is still in the 'as quenched' condition.

"The stretch press has proven superior over several other types of forming methods for contouring large extrusions. Fig. 1 is a wide flange channel extrusion with finger cutouts. When forming by bar rolling, the web assumes a serious "canted" condition for such heavy unsymmetrical sections. Forming this same section on the stretch press by applying a very small tension load, and then bending the extrusion about the form block, produces a part within production tolerances.

Fig. 2 illustrates the symmetry of contour obtainable in heavy extrusions, when formed as above, even though large cutouts are made in the section before contouring.

"The economy of the tooling, ease of handling the parts, and speed of production establishes the desirability of this forming method."

The hydraulic stretch forming machine is manufactured by the Hufford Machine Works of Redondo Beach, Calif., and the process by which this forming is done not only eliminates much of the grief, cost and delay of older methods, but also lowers the expense of tooling and, at the same time, raises production rates. It eliminates restrictions in design by permitting economical forming of parts which otherwise would be financially impractical to produce.

Melting Points of Metals and Alloys

THE melting points of those metals and alloys that have a melting-point range narrow enough to be considered a single temperature are given in the left-hand column of the chart on the opposite page. The melting points of various alloys having a wider range appear in the right-hand column. The color scale in the center shows the approximate temperatures at which color changes appear. The right-hand column with both Centigrade and Fahrenheit scales can be used as a general conversion table between these scales. An accurate conversion can be obtained from the formulas:

$$\text{Deg. F.} = \frac{9}{5} \times \text{Deg. C.} + 32,$$

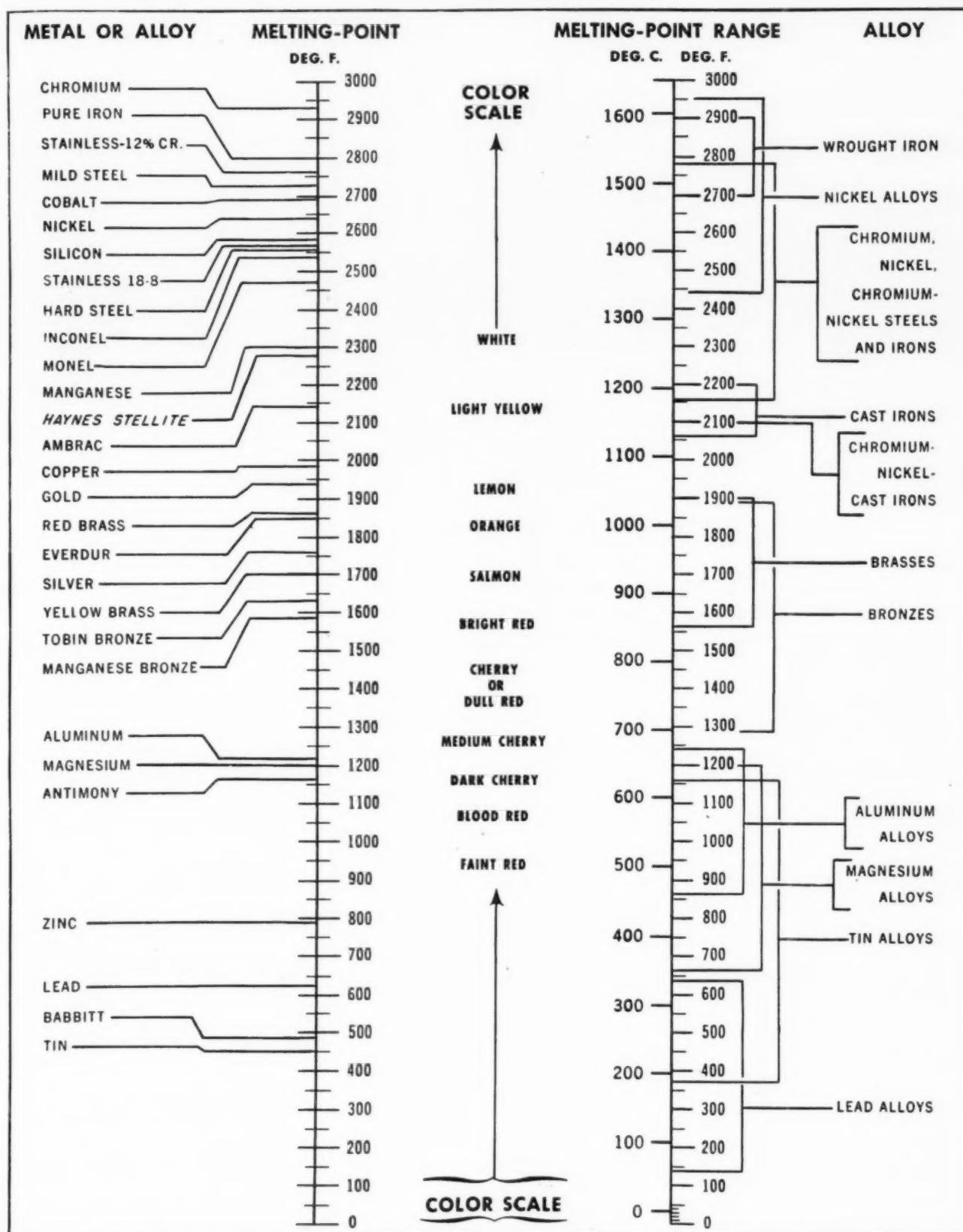
$$\text{and Deg. C.} = \frac{5}{9} \times (\text{Deg. F.} - 32).$$

Degrees Centigrade can be converted to degrees Fahrenheit easily by mental arithmetic. Simply multiply the Centigrade

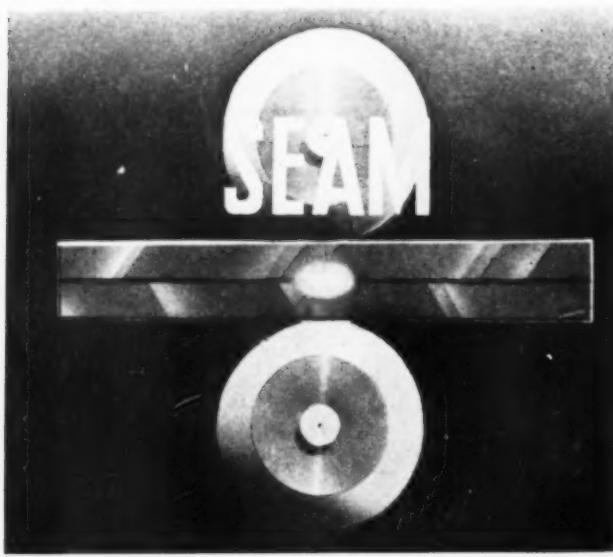
temperature by 2, subtract 10 per cent, and add 32. For example, 640 deg. C. times 2 equals 1,280; minus 10 per cent equals 1,152; plus 32 equals 1,184 deg. F. For rough estimating purposes, 640 deg. C. times 2 equals about 1,300; minus 10 per cent equals about 1,170; plus 32 equals about 1,200 deg. F.

The color scale is purposely indefinite as to the border lines between the colors, because of the difference of opinion as to color names, and because the amount of light present affects the color seen. The colors for the temperatures indicated can be seen only in a dark location. In a well-lighted shop, faint red may not appear until the metal had reached a temperature of 1,100 or 1,150 deg. F.

Melting Point Table



This table and accompanying text is reproduced, with permission, from "Oxy-Acetylene Tips," The Linde Air Products Company, New York City.



Resistance Welding

This article has been condensed from a paper entitled "Types of Resistance Welding Work" by F. R. Woodward, welding engineer, Westinghouse Electric & Mfg. Co. Illustrations are taken from General Electric Company's movie—"This is Resistance Welding."

RESISTANCE welding is the process of joining two or more metallic parts into an assembly—the heat for the formation of the weld being created by the resistance of the metallic parts and welding machine electrodes to the passage of the electric current supplied by the welding machine. Not all of this heat is generated at the desired point—at the juncture of the weldments. The flow of heat to or from the juncture, assisting or retarding the localization of the welding heat, is governed by the heat gradient established by the welding current acting on the various resistive components.

Resistance to the flow of current, thus resulting in production of heat, exists at several different points.

1. In the materials being welded.
2. In the electrode materials.
3. At the contact between weldments (affected by several conditions, scale, pressure, etc.)
4. At the juncture between electrodes and weldments (affected by electrode conductivity, several conditions, and area of contact as well as by the above weldment surface conditions).

The greatest heat losses, reducing the total heat available for welding, are those removed from the weldments by the electrodes which are often water-cooled, and by conduction through the material in the weldments themselves, usually from the localized area where it is desired to produce the weld.

Weld Requirements

In order to produce a strong weld, it is usually necessary to bring the "faying" or contacting surfaces of the two weld-

ments up to their respective welding temperatures at the same time and cause a blending of a portion of each weldment in the formation of a "weld zone," "nugget," or "slug," terms usually typical of a certain type of resistance welding. Thus it is difficult to produce a satisfactory weld between dissimilar metals which will not alloy, and any weld so produced—often termed a "stick" weld—will be nothing more than a surface molecular interlocking joint.

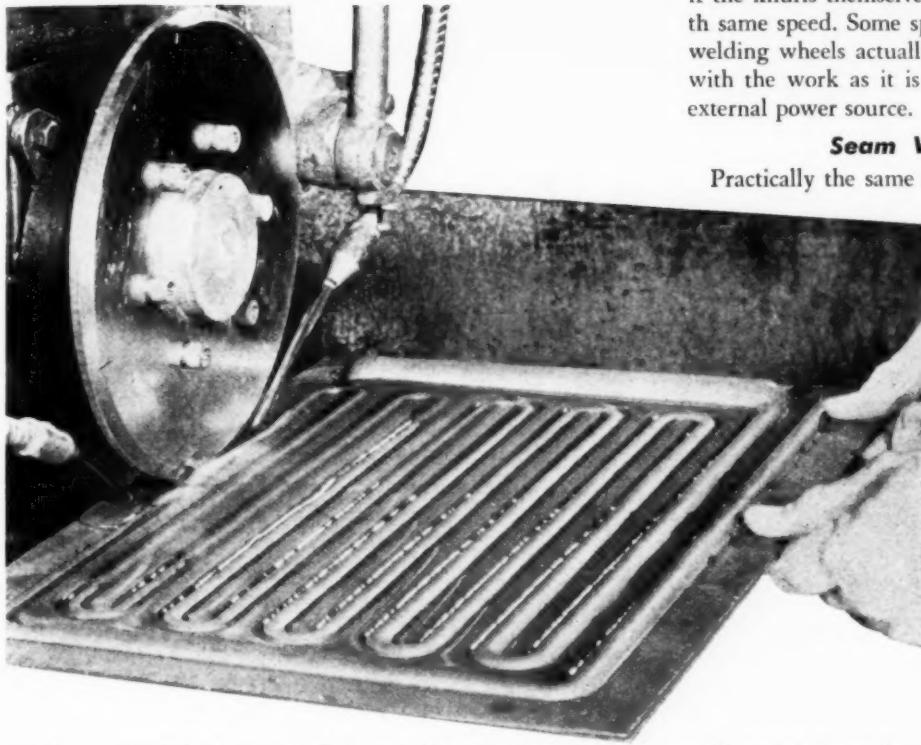
Seam Welding

Seam welding is similar to spot welding except that the stationary electrodes of spot welding are replaced with welding wheels, together with some means of causing rotation as they move along the work being welded. The wheel electrodes usually move the work at a rate of from two to fifty feet per minute. At the higher speeds the current application may be continuous, in which case each half cycle of alternating current produces a small weld overlapping the previously formed weld to form a continuous seam.

Welding Set Up

One-twelfth of an inch is a satisfactory spot spacing on No. 22 gage materials to produce a continuous seam weld. On heavier materials, however, the spot spacing must be greater in order to prevent excessive "build-up" of heat ahead of the welding wheel. It is necessary, when striving for best welding results, to interrupt the welding power so as to provide necessary "off time" for the cooling of each individual weld spot. Spot spacing for seam welding two pieces of $\frac{1}{8}$ " material should be about $1/5$ ".

As a rule, we can say that the seam welding of mild steel



if the knurls themselves are of the same diameter and have the same speed. Some special machines are work driven, the welding wheels actually being driven by friction in contact with the work as it is pushed through the machine by an external power source.

Seam Welding Electrodes

Practically the same considerations, in regard to the elec-

Fig. 1—This shows a refrigerator evaporator being fabricated by the use of seam welding. Application of seam welding has resulted in a more durable evaporator and shortened the production process.

can be accomplished very well having "heat" and "cool" periods of equal duration. Materials having a higher conductivity require a longer "cool" period, and materials having a lower conductivity may be welded quite satisfactorily with a shorter "cool" period.

Seam Welding Machine

The classification of different types of seam welding machines is rather complex. In the first place, most seam welders are air operated as far as the mechanical pressure requirements are concerned. In regard to the method of operating the upper electrode, the machines may be classified as rocker arm and press type. The rocker arm machine is illustrated, which shows a heavy duty type manufactured for the seam welding of aluminum and carrying a special "geneva" drive for intermittent motion of the welding wheels. This machine was built for the production of quality spots in thicker aluminum alloy sheets.

The wheel arrangement of the machine illustrated is "circular," similar to the type of wheel arrangement that would be used for welding the circular bottom in a pail. If the wheels were arranged for carrying the material back over the lower or upper arms such as would be necessary in welding the longitudinal seam of a drum, the wheel arrangement would be called "longitudinal." If changes in wheel arrangements are possible on the same machine, the welder is termed a "universal" machine and may be changed from "circular" to "longitudinal" and vice versa at any time desired.

A machine is also described by its method of driving the welding wheels, such as "gear drive," in which one of the welding wheels is driven by a gear on the spindle, carrying the welding wheel. In this case the peripheral speed of the welding wheel will change as the diameter of the wheel changes with wear. The machine may be "knurl driven," in which case one or both of the welding wheels are engaged by friction with a knurled wheel, which is in turn gear driven by the drive motor. In this case the welding wheels may be of different diameter and still drive with equal peripheral speed

trode materials, apply to seam welding as to spot welding. In addition, it is desirable to design the seam welder in order to automatically trim the welding wheel to the desired width. This can be accomplished by proper design of the driving knurl, or by using an idler knurl as a trimming device on gear or work driven machines.

The cooling of seam welder wheels is highly important in maintaining wheel life and usually necessitates an external spray of water on the welding wheels and work since most seam welder wheels are not cooled internally. A large volume of water is often necessary in order to prevent wheel deterioration and to obtain satisfactory welding results. Welding entirely submerged is extremely advisable on small parts which justify the manufacture of a special machine.

Intermittent Seam

Most seam welding machines weld through two pieces of material, which are "lapped" together, so that there is a double thickness of material at the joint. If the welded joint is not continuous, or the individual weld spots do not overlap, then the weld is termed a "roll spot" or a "stitch weld."

Butt Seam

Some welding machines of a more special nature are used to produce a butt seam joint such as used commonly in the fabrication of the longitudinal seams in pipe or tubing. In this type of machine, the material is formed to a cylindrical shape by other equipment and fed into the machine from the right, with the seam or slit in the tubing upward and guided by the seam guide wheel which penetrates in the slit in the unwelded tubing. The tube then progresses on between the upper and lower entering rolls to the welding wheels and the side pressure rolls, where the actual tube welding is accomplished.

The welding wheels are connected by two flexible bands to the transformer overhead, whose secondary voltage is regulated by means of a primary tap change switch. This tubing is usually welded at high speeds using continuous power application with no interruptions other than the inherent 60



Fig. 2—Seam welding the tube of an automobile shock absorber.

cycle alternations. Hand wheels provide full adjustment for varying the position of the welding and positioning rolls in order to accommodate various size tubing.

Projection Welding

Projection welding is that method of resistance welding in which the localization of pressure and current is accomplished by means of irregularities formed in one or both of the weldments being assembled. These irregularities allow the use of flat, plain or die type electrodes on the welding machine itself. Current densities on the dies are likewise decreased, allowing the use of lower conductivity, harder electrode materials, which results in considerable reduction in electrode or die maintenance on this type of equipment.

In projection welding it is especially important that the parts to be welded be designed with the thought in mind of creating the proper fusion temperature at precisely the same instant in both elements being welded. For this reason it is desirable that the projections be made in the heavier material so that these higher resistance points will not be burned off before the other flat weldments can be brought up to proper fusion temperature.

Projection welding of aluminum and copper bearing alloys is considered very difficult and requires unusually critical control of the welding machine as well as careful design of the weldment to prevent expulsion of the weld metal on the projections.

Types of Projection Welders

Projection welders are almost invariably of the press type machine in order that the die mounting platens may remain perfectly parallel at all times. The method of obtaining mechanical movement or electrode pressures may be by air, hydraulic or motor operation, or through a cam or toggle mechanism.

A specially constructed machine of this latter type has a heavy, rigid frame enclosing the welding transformer beside

the primary tap change switch shown on the side of the machine. The driving motor is located on top of the frame, and by means of a rubber belt drives a gear box located over the welding transformer inside the frame. The gear box in turn works on a toggle mechanism enclosed in the moving slide of the machine, lowering the upper electrode on the work being welded. The mechanical resistance of the work forces the toggle mechanism, and its attached piston on the top of the frame, to move upward slightly against a regulated air pressure, which provides means for adjusting the welding pressure obtained in operation.

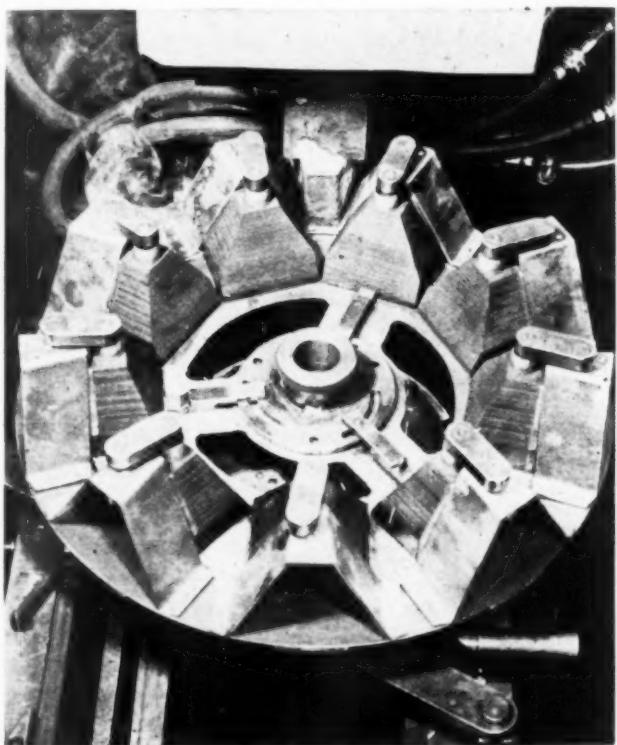
One of the interesting features of this machine is the rotating table carrying 12 lower dies. This table has an intermittent motion derived from its associated drum cam at the lower right front of the machine. One or more operators can thus be loading the table while the machine is running continuously. Production of this machine is approximately 80 welded assemblies per minute of metal radio tubes.

The projection welder machines, as a class, are constructed considerably more rigidly than either the spot welders or seam welders. This is because of the necessity of greater total pressure to make several spots simultaneously and the necessity for maintaining perfectly parallel alignment of die mounting platens, in order that the customary multiple projections may all contact with approximately equal pressure.

As previously mentioned, the customary design of projection welding equipment allows the use of broad, flat, low conductivity, hard electrode materials. The use of these higher resistance materials, with accompanying low thermal conductivity, necessitates very adequate water cooling brought close to the surface of the electrodes in order that the electrode materials shall not become so hot as to result in cracking the hard electrode materials.

In general, it can be said that the process of projection welding offers the most rapid assembly technique of any of the resistance welding methods.

Fig. 3—A close-up of the projection welding of fans for large motors.

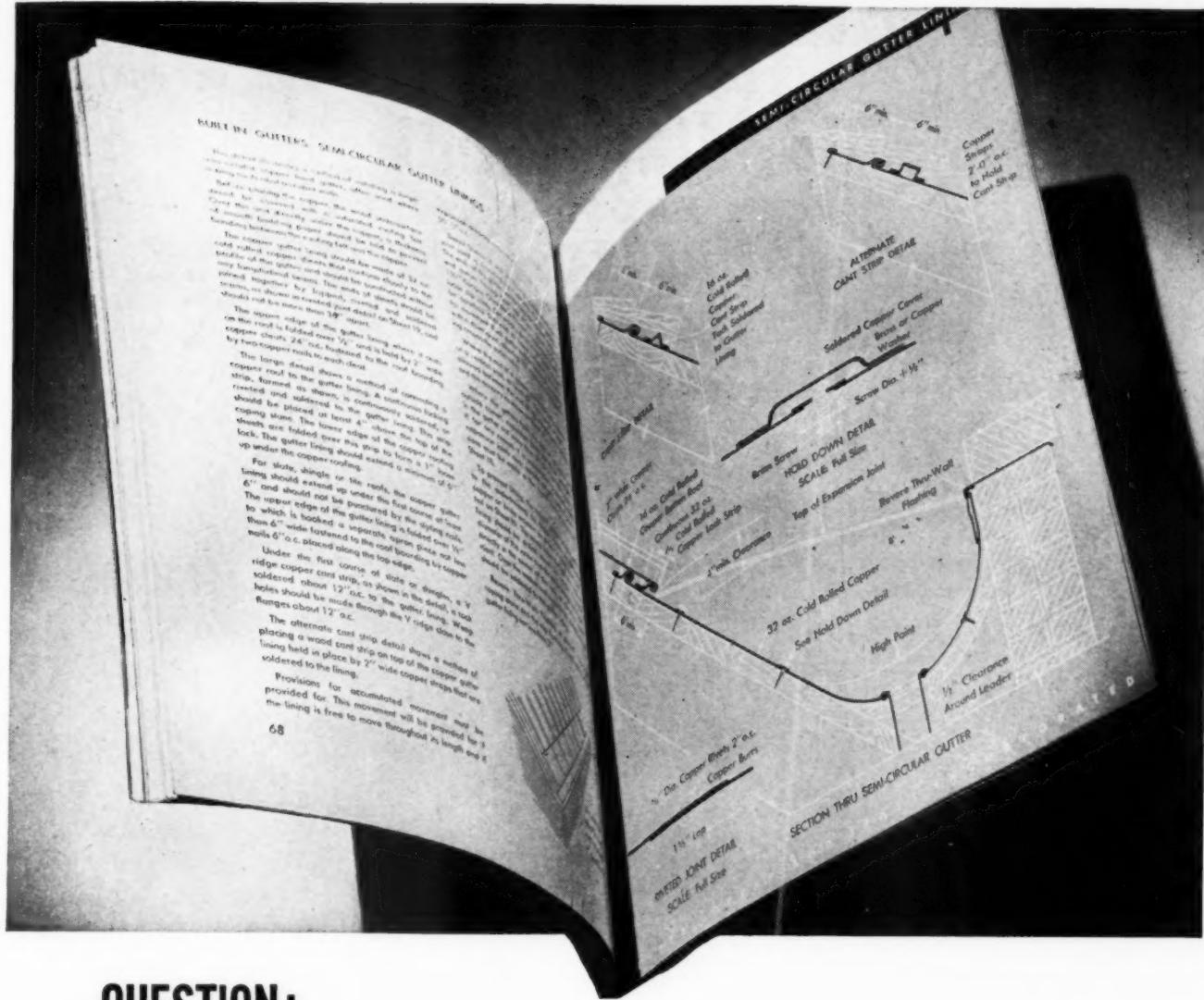


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What's the best way to install semi-circular gutter linings?

ANSWER:

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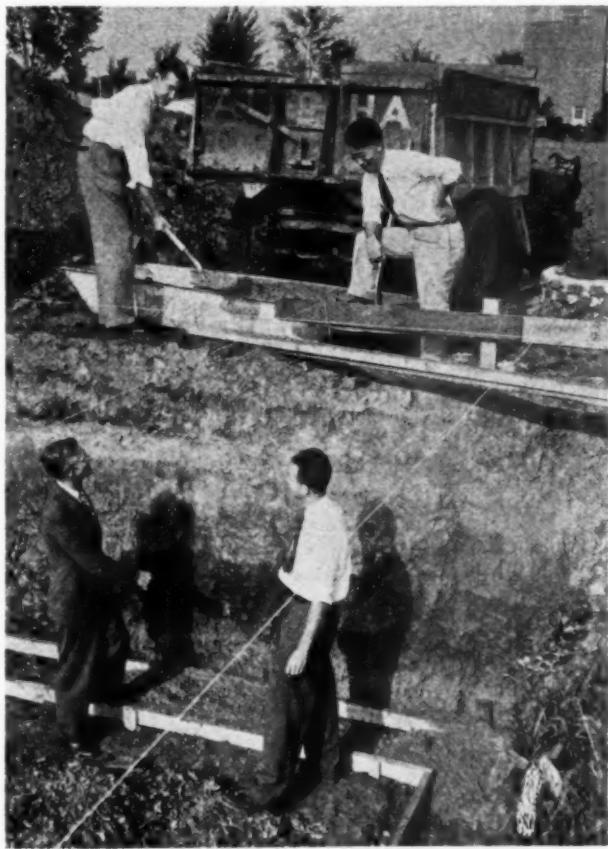
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ASSOCIATION ACTIVITIES



Research Residence

Actual construction has commenced on the new Research Residence which is being built at the University of Illinois through a co-operative arrangement between the National Warm Air Heating and Air Conditioning Association and the University. The new residence is the first structure to begin building in the new Small Homes Research Center at the University.



In the photo are R. W. Roose, Research Assistant in charge of the house, and Prof. Seichi Konzo, left and right above, and Prof. W. H. Scheick, head of the Small Homes Council, and Prof. D. B. Lindsay, designer of the house, left and right below.

As explained in the July AMERICAN ARTISAN the new residence is to be completely furnished and occupied as was the previous Research Residence, in order to make possible the collection of accurate data on warm air heating and air conditioning.

Since the house is a unit in the Small Homes Research Center it will also be used in studies of landscaping, decorating, kitchen arrangements and such studies.

Milwaukee

The Milwaukee Sheet Metal Contractors Association held their August dinner meeting at the McKinley Avenue Cafe and decided to hold their next two meetings in the same place. There was quite a bit of lively and informative discussion at the meeting and subjects of interest to all members are scheduled for future meetings.—Paul L. Biersach, Secretary.

Buffalo

THE Buffalo Sheet Metal, Warm Air Heating & Air Conditioning Association had as their guest speaker, Gene Brown, Sales Manager of Morrison Steel Products, Inc., at a dinner meeting at the Hotel Markeen, September 4th. Mr. Brown's talk centered around material shortages as they apply to the manufacture of forced warm air furnaces, explaining why they are coming through in such limited quantities.

In order to make future meetings more beneficial, a membership survey was conducted resulting in the following preference in subject matter:

- | | |
|--------------------------|------------------------|
| 1—Articles on Heating | 6—Priority Data |
| 2—Guest Speakers | 7—Ventilation Data |
| 3—Entertainment | 8—Motion Pictures |
| 4—News Bulletins | 9—Grievance Reports |
| 5—Code & Manual Lectures | 10—Articles on Roofing |

Members were advised to stop selling labor and spend more time merchandising equipment. They were also urged to hold their prices down to encourage sales. They were warned that most veterans are not buying single homes at all, most of them want to rent, resulting in a program of multiple dwelling construction. The outlook for future home heating may not come up to expectations and members were told to restrict quotations to what buyers consider a fair price, since too high prices could result in much work being abandoned.

If light gauge galvanized iron sheets are available in any reasonable quantity at all, the Washington, D. C., C.P.A. office offered the Buffalo contractors little encouragement according to a reply received to a recent petition. Attendance 62.

M. J. RODMAN, Secy.

Coming Conventions and Meetings

1946

Oct. 29-Nov. 1—Refrigeration Equipment Manufacturers' Association, Fourth National Exposition. Cleveland Public Auditorium. R. Kennedy Hanson, Show Director, 1107 Clark Building, Pittsburgh 22, Pa.

1947

Jan. 27-30—American Society of Heating and Ventilating Engineers. 53rd Annual. Hotel Statler, Cleveland, Ohio. A. W. Hutchinson, 51 Madison Ave., New York 10, Secretary.

Jan. 27-30—7th International Heating and Ventilating Exposition. Lakeside Hall, Cleveland. Charles F. Roth, manager of the Exposition, International Exposition Co., New York.

Jan. 29-30—National Warm Air Heating and Air Conditioning Association. Hotel Cleveland. George Boedner, 145 Public Square, Cleveland 14.

Feb. 3-4—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. Annual. Homer Selch, 944 Hosbrook St., Indianapolis 3, Ind.

Feb. 9-12—Sheet Metal Contractors' Association of Wisconsin, Inc. 32nd Annual. Schroeder Hotel, Milwaukee. Paul L. Biersach, Secretary, 225 E. Michigan, Milwaukee.



People are tired of dark, gloomy basements. And when they start to build or make major replacements they will demand that air ducts and other exposed sheet metal work have a bright, cheerful paint finish that will blend in with the improved appearance of this re-discovered room.

That's why sheet metal contractors say that the day of the "ugly duct" is out. In its stead, as fast as materials can be had, they're using Galvanized ARMCO Ingot Iron with the PAINTGRIP finish for air ducts, furnace casings, and other exposed metal work.

Galvanized ARMCO Ingot Iron is an old favorite with contractors because it's a ductile, easy-working metal, and because people in the community know and trust the Armco name and familiar triangle.

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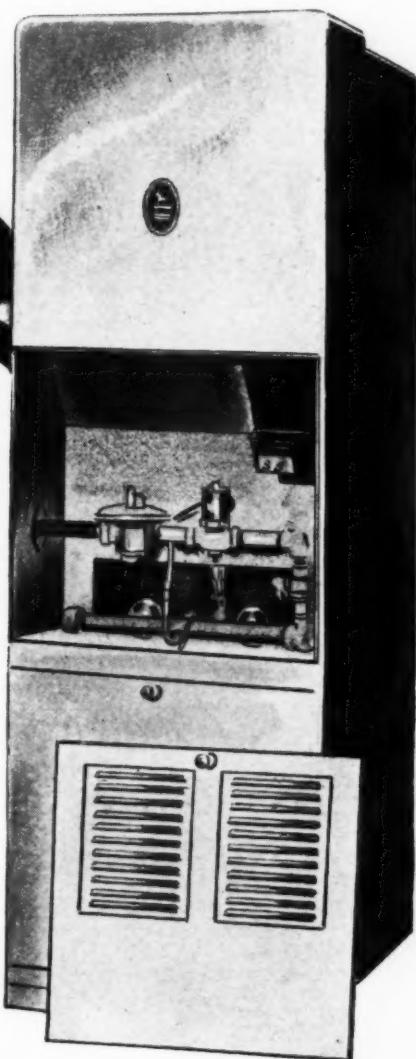


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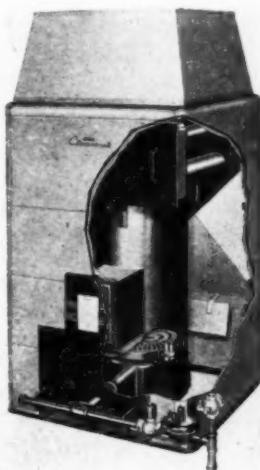
Equipment Developments

For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 108 and mail to us.

- △ Indicates manufacturer not listed in 1945 Directory.
- Indicates product not listed in 1945 Directory.

114—Climatrol Furnace

L. J. Mueller Furnace Company, Milwaukee 7, Wisconsin, is now shipping the new Mueller Climatrol Type 101 steel gas-fired gravity furnace, latest

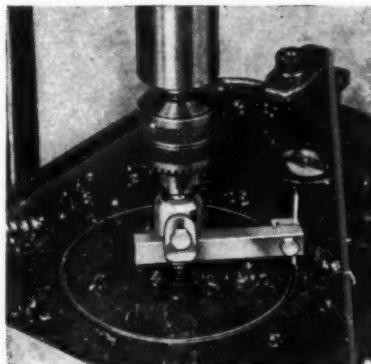


addition to the line of Climatrol heating and air conditioning equipment. Designed for the smaller home and replacement market, the AGA approved Type 101 Furnace is made in sizes of 90,000 and 135,000 maximum Btu inputs.

The Type 101 Furnace features an all-welded steel drum and tubular radiator of multiple-pass design, with two banks of staggered radiator tubes. Mueller's cast iron burner contains raised, individually drilled gas ports laid out in a concentric-circular pattern, which allows ample air around each port for efficient combustion. An integral part of the burner assembly is an air shutter that can be adjusted while the burner is operating.

• 115—Circle Cutter

Bruno Tools, Beverly Hills, California, announces a new all-purpose adjustable hole-cutting tool. This new tool quickly cuts smooth large-size holes in wood, steel, brass, hard rubber, aluminum, fibre, plastics and problem materials which might necessitate use of torches or other expensive equipment. The



Bruno Adjustable Circle Cutter cuts holes to any diameter from $1\frac{1}{8}$ inch to 8 inch through $\frac{1}{4}$ inch thickness in steel or other tough metals and any thickness up to $1\frac{1}{2}$ inch in plastics, fibre or wood. The tools are designed to operate in any standard drill press, woodworking machine, or suitably mounted spindle machine.

The Bruno Adjustable Circle Cutter is designed on a new principle which permits easy, yet accurate adjustment. It consists of a combination drill and pilot with a new improved high speed cutting blade, adjustable to depth and diameter. The exclusive 'Wedge-lok' cutting blade holder permits cutting edge to recede or yield from work while still maintaining steady pressure and feed. Cutting blade is easily resharpened without special tools by grinding on one edge only.

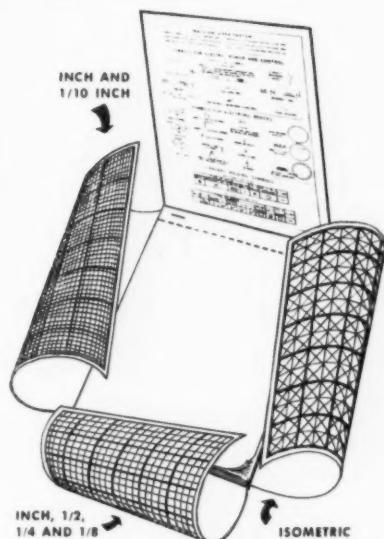
*Patent applied for.

△ 116—Jiffy Sketch

Jiffy Sales Co., 1831 East 37th St., Cleveland 14, has introduced Jiffy Sketch, a scale drawing pad that enables one to make properly proportioned drawings without use of ruler, drafting board or T-square, and which may be used in the shop or in the field as easily as in the office.

The Jiffy Sketch pad contains 75 sheets of high quality tracing tissue, enclosed within a cover jacket that consists of four cardboard flaps. Various scales are printed on three of the flaps. To use the pad, simply fold back the cover flap

and then place one of the tissue sheets over the scale you wish to employ. The drawing is made accurately to scale with the aid of the printed lines which show through the tissue.



The pad measures approximately 9 x 12 inches. Sheets are perforated for easy removal. Valuable information is printed on the back of each cover flap—basic mechanical drafting standards; electrical, welding and architectural symbols; decimals of a foot; decimal equivalents of fractions, with circumferences and areas of circles.

Jiffy Sketch will be on sale at most dealers. The price is \$1.65 each or \$1.50 each in lots of six or more. Or you may obtain one of the pads by sending a dollar to Jiffy Sales Co., 1831 East 37th St., Cleveland 14, Ohio.

• 117—Tri-Core Solder

Alpha Metals, Inc., 359 Hudson Ave., Brooklyn 1, has developed a unique solder product called Tri-Core. It is a self-fluxing solder, with three cores located below the surface of the wire. This design assures continuity of flux flow and prevents production slowdowns.

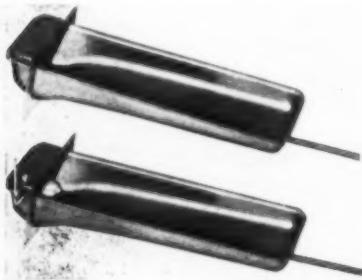
A descriptive bulletin has been prepared by the manufacturer and is available on request.

Equipment Developments

For your convenience in obtaining information regarding these items, use the coupon on page 108.

118—Humidifier Pan

The C. A. Olsen Mfg. Co. of Elyria, Ohio, has designed and is producing a universal type humidifying pan that can be easily installed in any make of furnace having either a round or square casing.



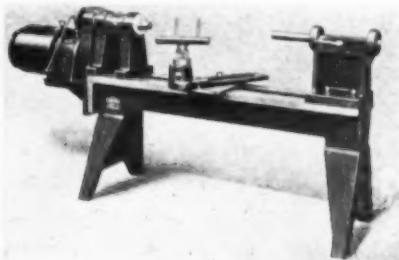
Original in design, the large water capacity—over 1½ gallons—eliminates the necessity of frequent fillings. Large evaporating surface provides ample humidity to the circulating air stream.

The extra heavy coating of vitreous enamel that covers the entire surface of the pan assures long life.

△ 119—Spin Lathe

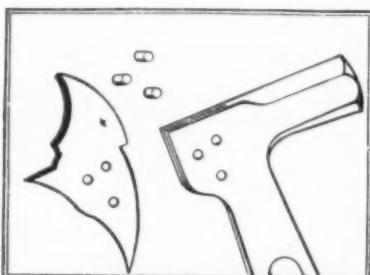
Ermac Company, 5531 South Vermont, Los Angeles 37, offers immediate delivery of a newly developed metal spinning lathe. The lathe was developed by an experienced metal spinner, who incorporated several features adding to the safety of operation.

Patent application has been made for two of these new features . . . a new, positive lock, adjustable tool rest and a positive lock, rotary cam tail stock.



The tool rest has a serrated, clutch type lock which definitely prevents slipping and possible injury, as compared with the old, set screw type lock.

The third feature which marks a forward step in metal spinning lathe construction is found in heavy duty, taper roller bearings, running in oil.



△ 120—Metal Cutter

Schild Manufacturing Co., 739 No. Broadway, Milwaukee 2, offers an inexpensive cutting tool—an all-purpose heavy duty sheet metal cutter with changeable blade—for furnace and sheet metal workers.

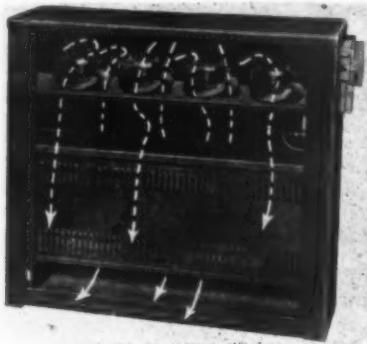
The blade has a cutting edge for heavier metals, up to 16-gauge, and is made of high-grade tool steel, ½-in. thick. Blades are attached firmly with three easy-to-remove pins. The thickness of the blade is designed to withstand abuse.

◆

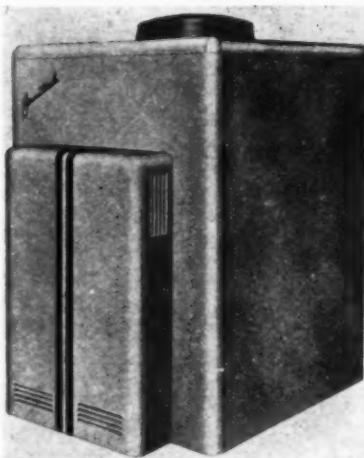
121—Comfortaire

American Coils Co., Newark have secured a patent on a new type unit air conditioner called the Comfortaire Conditioner.

Basic improvement of this new conditioner is the fact that it removes the moisture from the air but does not cool the air below a point of comfort while doing so. It accomplishes this by condensing out the moisture in the air through use of a low pressure area set up within the unit.



Moist air enters this area and the excess moisture is condensed out and the air mixes with cooled air and emerges as cooled, drier air but not overly chilled air. The manufacturer has prepared literature describing the two models now available.

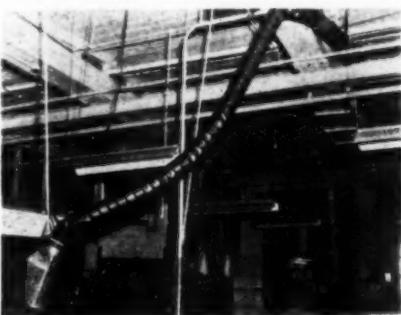


122—Janitrol Furnace

Surface Combustion Corporation, Toledo, O., manufacturer of Janitrol gas-fired heating equipment has announced a new model gravity furnace which is especially designed for greatest combustion efficiency and economical operation with gas.

There are two sizes in the new Janitrol Series GC S-64 gravity furnaces, 75,000 and 100,000 Btu. The combustion chamber and radiator assembly for both sizes is of all-welded 18-gauge special steel, with all larger joints seam welded by a special process to assure a minimum of stress by maintaining a uniform welding temperature.

Automatic controls maintain even temperature and operation of the gravity furnace is quiet.

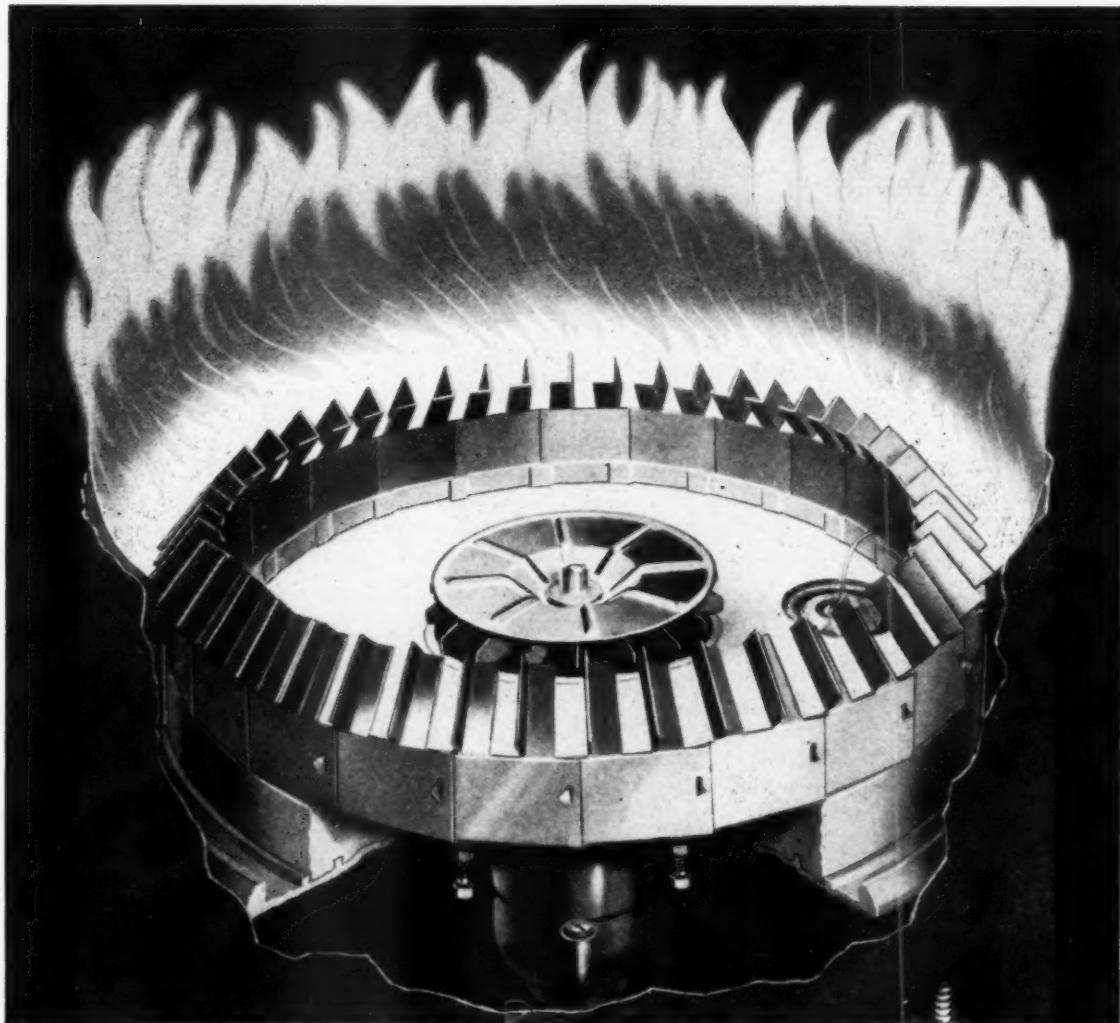


● 123—Spiratube

The Warner Brothers Company, Spiratube Division, Bridgeport 1, Connecticut, has developed "Spiratube," a self-extending, non-collapsible but retractable tubing for handling air, dust or other light solids under crowded conditions.

"Spiratube" takes tight undue turns easily, without the use of elbows or special fittings and without crimping to cause blockage of the channel or air turbulence. The continuous helical spring which forms the core is spiral-stitched into the fabric, so there are no exposed wires to create fire hazards or ridges to impede air or collect solids.

THE *Toridheet* ROTARY



Everybody Knows You Can't Build a Live Reputation on "Ghost" facts

No sir, you've got to have the solid facts back of you if you want a solid reputation for your product. That's another way of saying that Toridheet Rotary could only earn its reputation for high efficiency and spectacular economy by delivering *big efficiency and spectacular economy . . . not just in one home but in thousands of homes.*

A swift word of appreciation from one user to another—a pat on the back—so to speak—from one dealer to another, based upon satisfactory experience and the constant multiplication of this feeling over a long period of years wherever oil burners are used, means only one thing, Toridheet Rotary delivers service that is truly different and economical.

TORIDHEET DIVISION

CLEVELAND STEEL PRODUCTS CORPORATION, CLEVELAND 2, OHIO

Affiliated Canadian Manufacturers: Conroy Manufacturing Company, Ltd., Catharine St., St. Catharines, Ont.

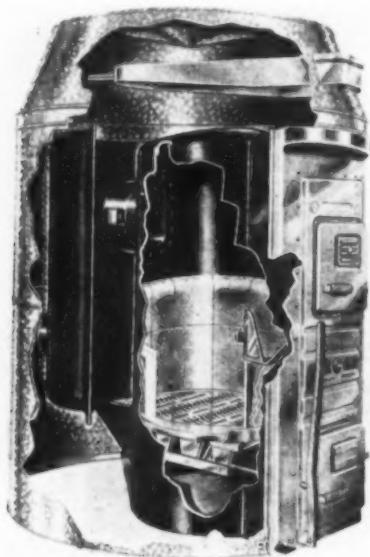
OIL BURNERS • OIL BURNER BOILERS • OIL WATER HEATERS
AIR CONDITIONING UNITS • COAL AND GAS FURNACES

Equipment Developments

For your convenience in obtaining information regarding these items, use the coupon on page 108.

124—Airtemp Coal Furnace

Airtemp Division, Chrysler Corporation, 119 Leo St., Dayton 1, Ohio, is introducing a new steel coal-fired furnace in 22, 24, and 27-inch sizes. The coal furnaces are for gravity operation and constitute an entirely new addition to the Airtemp line.



The new furnace has an all-steel front with concealed hinges. An ingenious method of attaching the casing by merely hooking it to the steel front molding simplifies the installation of the casing and eliminates the use of bolts. The body and radiator of the furnace are of electrically welded construction and one of the outstanding features is the combination one-piece dome and door cap which is double insurance against gas leakage.

The furnaces are equipped with heavy-duty locomotive bar-type grates with a double-acting dumping mechanism and a waist-high shaker lever. This type of grate assembly may be used for either bituminous or anthracite coal. The fire pot is lined with non-spalling refractory and standard equipment includes a vitreous enameled humidifier.

125—Floor Furnace

Royal Heaters, Inc., 1024 Westminster Avenue, Alhambra, Calif., manufacturers of Gas Fired Furnaces and Evaporative Coolers, is introducing a new post-war dual floor furnace. Model D-45000 is the first type to come off the



production lines since Royal Heaters, was incorporated.

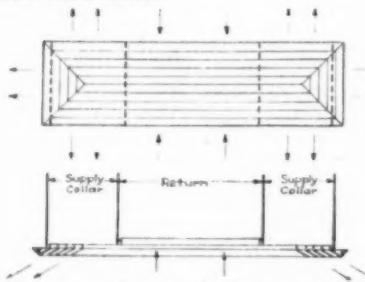
The Royal dual-floor furnace is hidden below floor level, is of shallow flatbed construction (fire-box is only 18 in. deep), and can be easily installed without the need of basement or pit. Its shallow depth and welded construction safeguard against the danger of flooding in the rainy season. All air for combustion is taken from the outside. Both pilot and burner valves are equipped with safety locks.

Model D-45000 (45,000 BTU input) is available for immediate delivery. Model D-55000 (55,000 BTU input) will be ready for delivery in September.

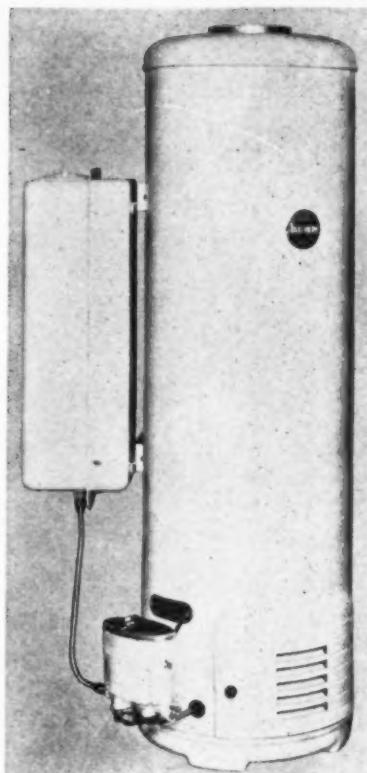
Both pilot and burner valves are equipped with safety locks. Royal furnaces have the AGA Seal of Approval.

126—Agitair Air Diffuser

Air Devices, Inc., 17 East 42nd Street, New York 17, has designed the Agitair RS-42 especially for applications requiring combination supply and return air feature. The RS-42 is square or rectangular in shape, easily installed requiring little head room.



The new feature, built in at the factory, is designed to save costly "on the job" intricate duct work. Permits both ducts to run on same plane with separate connections for both supply and return air. Eliminates special cutting and sealing to prevent supply air leakage.



• 127—Fuel Tank

Duo-Therm Division, Motor Wheel Corporation, Lansing, Michigan has introduced a 5-gallon fuel tank for use with its new line of automatic fuel oil water heaters. Attached right to the side of the heater by a simple operation, the tank is ideally suited for use where a large capacity fuel tank is not immediately available and enables the user to put his Duo-Therm water heater into prompt service. Full instructions for attaching the tank to the heater are included in each carton.

128—Spray Nozzle

Spraying Systems Company, 4021-F W. Lake St., Chicago 24, Ill., now has available a new large-capacity pneumatic atomizing nozzle for $\frac{1}{2}$ -inch pipe connections. Capacities of 20, 40, or 60 gph are provided by these nozzles, built to



operate with compressed air—although other gases or steam can be used. Illustrated is a nozzle with shut-off needle, or these nozzles may also be obtained without a shut-off needle if required. Nozzles are made of brass or stainless steel.

DEALER'S CHOICE...

BARTON is the dealers' choice! Its one size and model fits firepot sizes from 14" to 30"—round or square heating plants. No need to carry a large stock of different sizes and models. BARTON's single size and model . . . pre-assembled at factory . . . assures easy, profitable installation . . . complete customer satisfaction.

PRECISION ENGINEERED—BARTON's precision engineering combines best features of other burners with exclusive innovations and advanced design. Delivers higher heating efficiency . . . even temperature . . . dependable, trouble-free, economical operation.

SAFER—Because all working parts, including gas valves, controls and gas pressure regulator, are completely protected by attractive, sturdy, enamel finish burner housing. Children can't tamper . . . no way control settings can be disturbed.

CLEANER—All-enclosing BARTON burner housing is finished in easy-to-clean, smooth baked enamel. No dangerous or unsightly projections. No dust-catching crevices . . . no exposed mechanisms to collect dirt.

PROFITABLE INSTALLATION—BARTON's all-in-one unit is completely pre-assembled at the factory . . . ready for quick, time saving installation. Each BARTON installation a more profitable installation because of uniformity and assured results on each conversion.

EXACT FIT—No matter the type heating plant . . . round or rectangular . . . hot air, hot water or steam . . . BARTON's improved wall-flame type burner with spreader-baffle directing flames to sidewalls assures perfect conversion . . . higher heating efficiency.

GUARANTEED—The BARTON is unconditionally guaranteed for one full year.



Dealers: Mail This Coupon Now!

THE BARTON COMPANY

64 Glenwood Avenue • Minneapolis 3, Minnesota

THE BARTON CONVERSION GAS BURNER



IMMEDIATE DELIVERY

Including all controls—transformer, thermostat, limit control safety pilot



Here's your first step on the road to increased volume of installations, complete customer satisfaction, more profits! Mail the coupon below today! Return mail will bring you full information about the BARTON—America's outstanding conversion gas burner—and why it is important to you! Don't delay. Send the coupon in right away!



Converts Hot Air,
Hot Water or Steam
Heating Plants to
Modern Gas Heat

THE BARTON COMPANY
64 Glenwood Avenue
Minneapolis 3, Minnesota

Gentlemen: I want to know more about BARTON's profit-making story. Please send me complete information today!

Name.....

Company.....

Address.....

City..... State.....

CHRYSLER AIRTEMP



"Here's an Agreement Designed for Year-Round Dealer Profits!"

The Chrysler Airtemp Triple Line of Heating, Cooling and Refrigeration products covers every selling season—brings opportunity for 12 months of *steady* income to dealers! There is not just one sharp sales peak preceded and followed by months of high-overhead inactivity.

Chrysler Airtemp has planned it that way with its three outstanding lines of products—a complete line of automatic home heating; *plus* the famous "Packaged" Air Conditioners; *plus* an outstanding line of condensing units and "Packaged" refrigeration equipment for commercial and industrial refrigeration. National advertising and merchandising support the year-round dealer profit program.



1, 2, or all 3

Chrysler Airtemp agreements are written for one, two or three of these advanced lines. It will pay you to look into the Chrysler Airtemp proposition. Write today for full information.

AIRTEMP DIVISION OF CHRYSLER CORPORATION

DAYTON 1, OHIO

In Canada: Therm-O-Rite Products Ltd., Toronto, Ontario

AIR CONDITIONING
HEATING • COOLING • REFRIGERATION



Where CONDENSATION is a factor make ductwork of BETH-CU-LOY

Changes in temperature often cause condensation of water vapor, which in turn may lead to corrosion in some types of sheet metal installations. Roof-top ductwork in large air-conditioning systems, skylight frames and ventilators are sometimes subjected to corrosion resulting from condensation.

The rate of this corrosion can be reduced materially by the use of Beth-Cu-Loy Galvanized Sheets. Their first line of defense is a

tightly bonded, uniform coating of Prime Western Zinc. Their inner defense is open-hearth steel containing 0.20 to 0.30 per cent copper. Sheets of this copper-bearing content have more than double the life of ordinary steel sheets as shown in atmospheric tests by the American Society for Testing Materials.

Beth-Cu-Loy sheets are highly ductile. They are easy to form, to hammer, to cut and to solder.

Clean, neat ductwork is a simple matter with sheets of Beth-Cu-Loy.

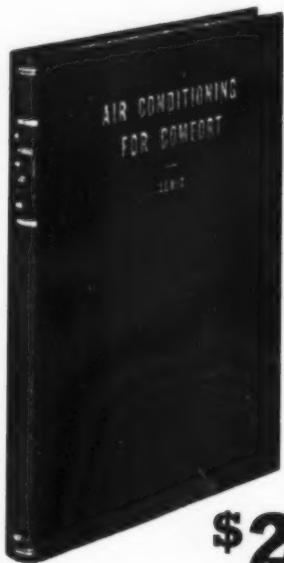
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation



BETH-CU-LOY GALVANIZED STEEL SHEETS

IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING



\$2.00

CONTENTS

- CHAP. 1—Terms used in Air Conditioning
- CHAP. 2—Heat and Air
- CHAP. 3—Air Conditioning Standards
- CHAP. 4—Air Conditioning and the Human Body
- CHAP. 5—The Psychrometric Table and Chart
- CHAP. 6—Humidity Controllers and Control
- CHAP. 7—Heat Transmission Through Barriers
- CHAP. 8—Ventilation, Solar and Appliance Heat
- CHAP. 9—Heating Systems
- CHAP. 10—Air Conditioning Systems
- CHAP. 11—Air Conditioning Apparatus
- CHAP. 12—Refrigeration and Refrigerants
- CHAP. 13—Refrigeration Compressors and Condensers
- CHAP. 14—Refrigeration Evaporators and Auxiliaries
- CHAP. 15—Record Forms for Heating and Cooling
- CHAP. 16—Air Distribution
- CHAP. 17—Water in Air Conditioning
- CHAP. 18—Noise and Its Control
- CHAP. 19—Air Conditioning Instruments and Measurements
- CHAP. 20—Codes and Operating Suggestions
- 10" x 16" Psychrometric Chart...Inside Back Cover

KEENEY PUBLISHING COMPANY

6 N. Michigan Ave., Chicago 2, Ill.

Enclosed is \$2.00 for a copy of *AIR CONDITIONING FOR COMFORT*. If this book should prove unsatisfactory, I will return it within 15 days for a refund.

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CITY & STATE.....

SEND TODAY FOR

Samuel R. Lewis'

"AIR CONDITIONING FOR COMFORT"

288 Pages—6 $\frac{1}{4}$ " x 9 $\frac{1}{4}$ "—Illustrated—
Cloth Bound—\$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Several complete examples of correct design procedure are given, together with forms for recording the design data, the proper filling-in of which are explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and chart in order to render both devices thoroughly understandable.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of air conditioning methods and equipment.

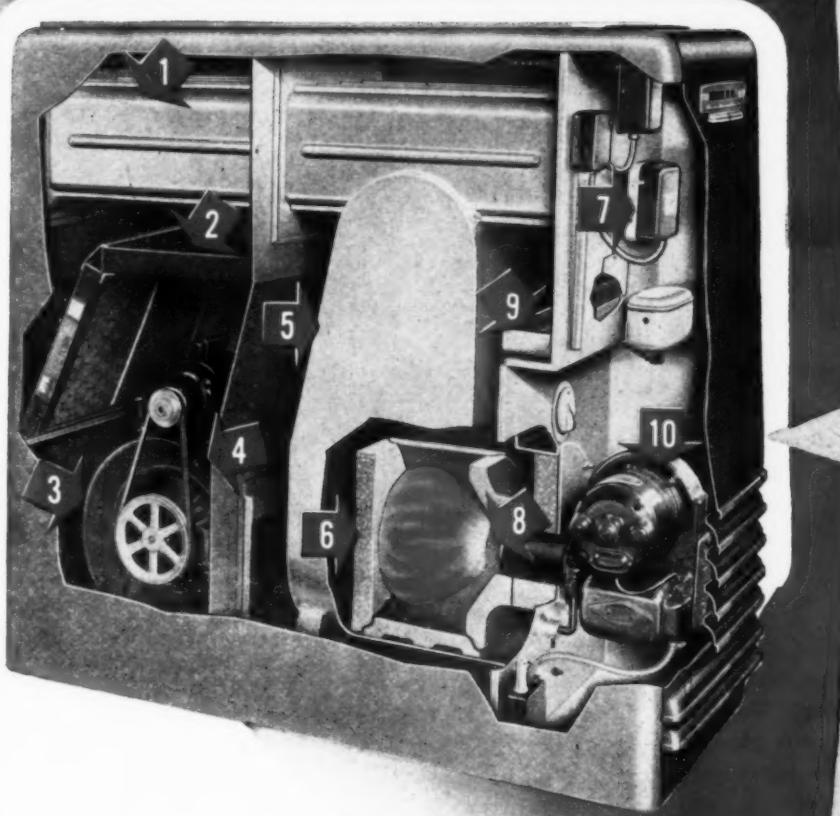
Send for a copy today. We know you will consider this volume one of the most readable and complete books on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Use the coupon at the left to order your copy now.

KEENEY PUBLISHING COMPANY

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Read the Story of Greater Profits in this cutaway view of **HEIL'S NEW ACTIV-AIR OIL-FIRED FURNACE**



What you see here is the inside story of a basically new and different kind of furnace-burner unit that brings you every important sales feature you've always wanted... but never had before!

Here, feature by feature, you see the full evidence of Heil engineering leadership. You see what five years of tireless research and development have accomplished in reducing noise and vibration to a minimum... in achieving new peaks of efficiency and operating economy through improvements in every phase of combustion... and in vastly reducing installation and service costs by pains-taking attention to the accessibility of every design.

YOU CAN'T AFFORD TO HANDLE ANYTHING BUT THE LEADER

Heil's new "Activ-Air" Furnace-Burner Unit brings you in one package thrilling new styling that assures more sales... advanced engineering that keeps you ahead of competition... and the quality construction for which Heil products have been famous for over a quarter of a century. Here is the unit that means more profits for you because it's designed the way you want it!

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

Manufacturers of Quality Automatic Heating Equipment Since 1924

THESE ARE THE FEATURES YOU ASKED FOR TO MAKE SALES EASIER

- 1 Quadruple, streamlined flue passages, effectively baffled, assure maximum heat transfer efficiency.
- 2 Large-area, replaceable filters provide clean air with minimum resistance to flow.
- 3 Oversize, low-speed blower is base mounted to reduce noise and vibration—provides ample capacity for large houses with low heat loss.
- 4 Quieter, smoother operation is assured by three-point, floating power motor mount.
- 5 Gas-tight, shielded-arc and seam welded heat exchanger of copper alloy steel assures long life.
- 6 Pre-cast combustion chamber brings flame to efficient operating temperature instantly—minimizes sooting.
- 7 Primary control, limit switch and fan control are front mounted for accessibility—all wiring in color coded harness.
- 8 Flame of symmetrical pattern and stable front maintains high CO₂ efficiency and eliminates pulsation even at low firing rates.
- 9 Automatic humidifier instantly accessible through low level door in front panel.
- 10 Bracket-mounted burner has ample space on all sides for inspection or adjustment when unit door is removed.

GET THE FACTS ON A HEIL FRANCHISE BEFORE YOU DECIDE

Your choice of a line decides your profit picture... that's why you'll want all the facts about a Heil franchise now. Here's what it means to you... a friendlier method of doing business... realistic quotas... whole-hearted co-operation... and intelligent merchandising assistance. Mail the coupon today for Heil's book showing all models in full color and giving complete details on the franchise that means more profits for '46.

MANY VALUABLE TERRITORIES STILL OPEN

THE HEIL CO., Dept. A-10
Milwaukee 1, Wisconsin

Please send me your new dealer specification sheets showing full color reproductions of Heil 1946 Boiler and Furnace-Burner models with complete details about a Heil franchise and openings in my territory.

Name _____

Company _____

Address _____

City _____, Zone _____ State _____



You can eliminate Roofing and Siding Maintenance with PLASTEEL



When you cover your buildings with PLASTEEL you build for permanency. Plasteel is a combination of steel, asphaltic plastics and mica. The steel core provides strength and rigidity—the plastics covering, applied under heat and pressure to an exact predetermined thickness on both sides of the sheet, hermetically seals the steel against the weather, salt spray and other corrosive conditions—and the mica finish coat forms a tough, durable, attractive

surface that needs no paint and no repairs. That's why you can eliminate roofing and siding maintenance with Plasteel!

Write for samples and complete data.

*can be fabricated without
injury to the sheet . . .*



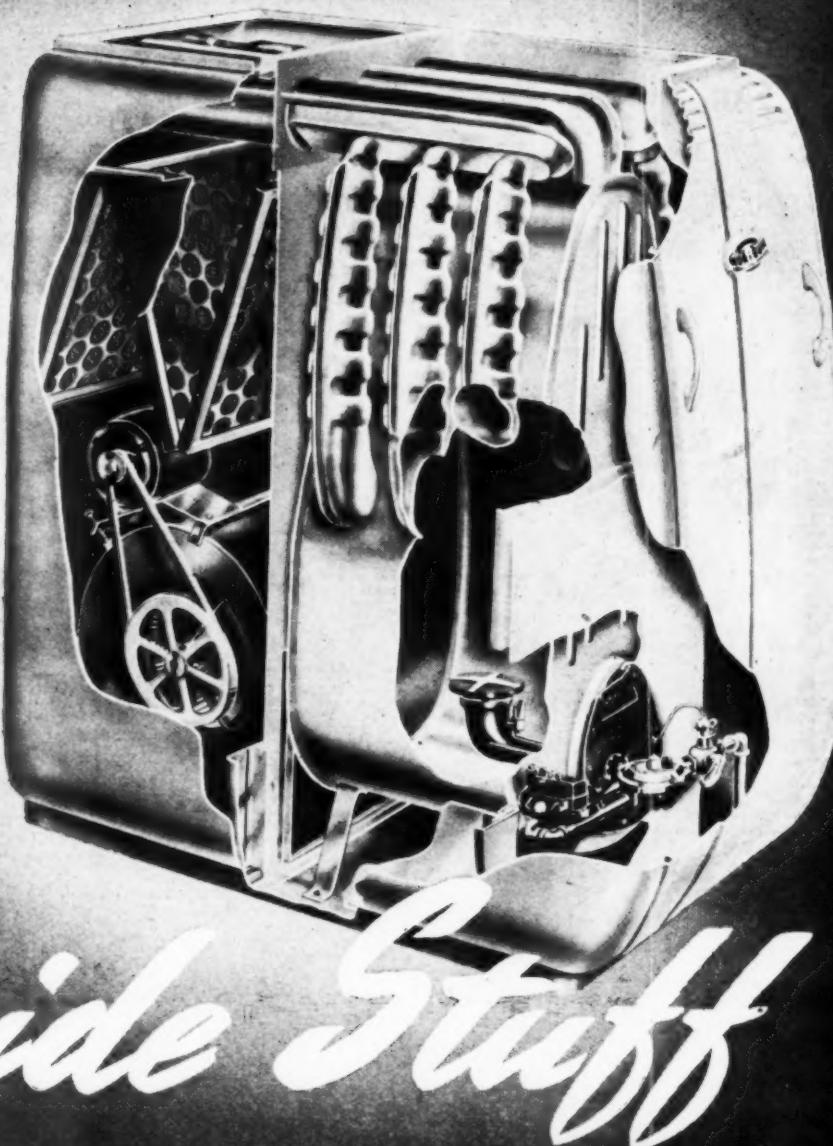
ROOFING
SIDING
FLASHINGS
VENTILATORS



PLASTEEL PRODUCTS Co.

General Office and Plant

Washington, Pennsylvania



Inside Stuff

While the MOR-SUN Pressed Steel Furnace is unusual in design, it is not a radical departure from proven principles. In fact, MOR-SUN has merely reverted to the basic function of a heat exchanger which is to create maximum efficiency in the least complicated form. Simplicity has been our watchword, and we were fortunate in that our engineers could work towards achieving the combination of simplicity and efficiency--secure in the knowledge that our factory would overcome any production problems encountered.

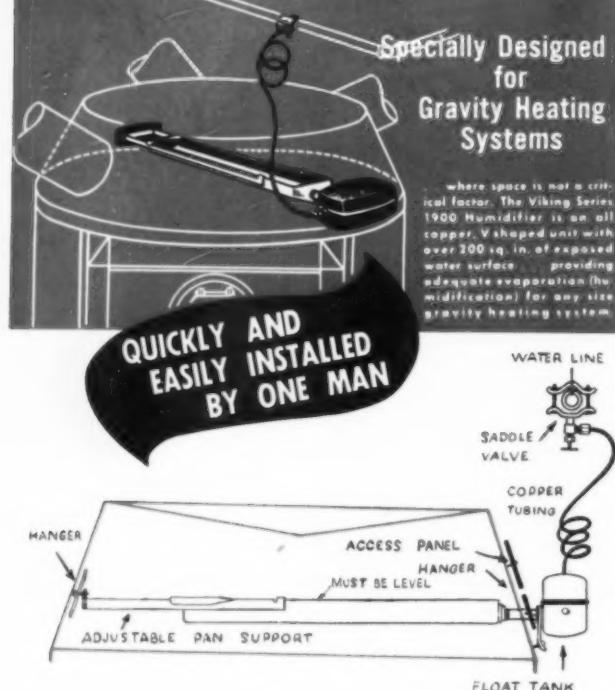
The MOR-SUN furnace is unique in that it is MASS PRECISION PRODUCED--every part is die pressed, including the casing. This assures uniformity of component parts. Sub-assemblies and assemblies are created on electronically controlled automatic seam and spot welders. By thus eliminating hand operations, MOR-SUN assures the user of a better furnace at a lower cost.

Many major and minor problems were turned over to our engineers as a result of a nationwide survey made among home owners, architects, builders and furnace dealers. The problems were solved, the result is the MOR-SUN PRESSED STEEL FURNACE!

MORRISON STEEL PRODUCTS, Inc., Buffalo 7, N.Y.

"The Sun Never Sets with MOR-SUN!"

Another VIKING profit builder the Series 1900 Humidifier . . .



The VIKING Series 1900 Humidifier is equipped with a telescopic pan support and will fit all sizes of bonnets or plenums. No special tools are required for the installation. Simply drill the front of the bonnet for a $\frac{1}{2}$ " pipe nipple . . . attach the front and rear hangers with sheet metal screws . . . install the humidifier pan and couple the float tank . . . drill a $\frac{1}{2}$ " hole in a convenient water line and install the saddle valve . . . connect the saddle valve to the Viking Top Seat Float Valve in the float tank and the installation is complete. A 4" or 5" hole cut just above the float tank will facilitate installation. A plate is furnished for use as an inspection door for occasional checking.

**Make an EXTRA Profit
on every
Furnace Cleaning Job**

Any householder interested in having his furnace cleaned or re-set is easily sold the VIKING Series 1900 Humidifier. Requires little, or no additional time to install while you're working on the furnace. Assures your customer all-season, automatic humidification. Costs you only \$8.25, easily worth \$15.00 to any discriminating householder. Carry one with you on every call.

NOW is the time
to CASH IN on
this item

While your customers are conscious of their furnace requirements . . . when they're getting set for the heating season ahead. Write today . . . get complete information all VIKING Humidifiers . . . or, better still . . . order enough Series 1900 Humidifiers to take care of your present requirements. Immediate shipment from stock, or from your jobber.

MAIL THE COUPON
Today



Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE.
CLEVELAND 2, OHIO

Gentlemen: Please ship at once

VIKING SERIES 1900 HUMIDIFIERS at \$8.25

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Bill thru my jobber Check enclosed

My Jobber is _____

Send Viking Humidifier Bulletin JD 313

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 108.

200—Williamson Gravity Furnaces

Williamson Heater Co., Cincinnati 9, has prepared descriptive pamphlets covering their three types of gravity furnaces—Standard, Tripl-life and Super-Steel. Each furnace fills a particular need and the booklets give complete specifications and sizes of the three lines. The company also states that satisfactory performance can be expected of these furnaces whether hand-fired with coal or adapted to any type of automatic heat with any fuel.

201—Indoor Climate Booklet

Indoor Climate Institute, Penobscot Building, Detroit 26 has introduced what they claim is the most impartial book ever written about heating. It is an analysis of the various types of heating systems and controls along with the fuels used.

General theme of the book is that as much thought and planning should be devoted to the heating system in building a house as to any other part of the construction. In addition they also claim that 'heat cannot be completely satisfactory unless it is automatic.'

Copies of the book can be obtained for twenty-five cents from Indoor Climate Institute, Penobscot Building, Detroit 26.

202—New Hollup Catalog

A new 64 page catalog of all Hollup electrodes and National oxy-acetylene gas welding rods has just been published by the Hollup Corporation, a division of National Cylinder Gas Company, Chicago.

Included are complete descriptions, color identifications, specifications conformed to, physical properties, welding procedures, recommended ranges and sizes available in the whole line of Hollup electrodes—mild steel, alloy steel, stainless, hard facing, cast iron, etc. There are tables on the weldability of metals, appearance inspection of welds, electrode consumption estimating chart and definitions of welding terms. A copy may be procured by addressing Hollup Corporation, 4700 W. 19th Street, Chicago 50, Illinois.

203—Kimsul Insulation

Kimberly-Clark Corporation, Neenah, Wisc., has issued a booklet which contains information for the home owner who is interested in either improving his present home or in giving his new home the benefit of modern, thermal insulation treatment. With especial emphasis on the comfort producing feature of house insulation, both winter and summer, it is pointed out that in a new house KIMSUL blanket type insulation can save up to 44% of fuel use; in an existing home KIMSUL applied in the attic can save up to 33% on fuel. On hottest summer days, a KIMSUL insulated house can be as much as 15% cooler.

How and where to install, ease of installation, efficiency, fire resistance and many other points are also covered.

Allied Building Credits, Inc.

Proudly Announces . . .

the Budget Payment Protection Plan

HERE is real protection for your budget payment customers—a service for which they would gladly pay regular premiums. But to make your selling easier—to offer you an additional sales tool Allied Building Credits, Inc., absorbs the complete cost and gives it to you and your customers free of charge.

The ABC Budget Payment Protection Plan is simply this—ABC will cancel all remaining payments on an ABC Instalment note should the note-maker die. Cancellation is complete—no further payments need be made either by the survivor or the estate.

Yes, "Something new has been added"

to make your selling easier and to build your prestige. But nothing new has been added to your notemaking procedure. No new form is required—nothing new for you or the buyer to sign.

The coverage is automatic. In fact this new protection service is already in effect—it covers all sales made on an ABC Budget Payment Plan for modernization and improvements since September 25, 1946. Be sure to tell your customers of this free protection. Be sure to tell your prospective customers personally and in your advertising that when they do business with you their time purchases are covered by the ABC Budget Payment Protection Plan.

**ALLIED BUILDING
CREDITS, INC.**



Complete Instalment Note
and Mortgage Services
for the Building Industry

If you are not already using the ABC Budget Payment Services to simplify your selling, write Allied Building Credits, Inc., 2504 First National Bank Building, St. Paul 1, Minnesota. You will receive complete information how this service can be made to work for you.



The delivery situation on fast-selling Gleason-Avery Thermostats is improving steadily. But we can assure early delivery only on orders received promptly.

Make sure your customers will enjoy the advantages of safe, dependable G-A Thermostats this year. Make sure of plenty of those profitable, trouble-free G-A Thermostat sales. Order now.

Approved by
Anthracite Industries Laboratory.

No. 130 Furnace Sentry Unit Package

Provides accurate temperature control for hand-fired domestic heating systems. Comes complete with easily operated G-A Thermostat (finished in attractive mar-proof Mirror-Lite) . . . plus damper motor and all accessories, ready to install. Direct orders accepted when accompanied by wholesaler's name.

New Literature

For your convenience in obtaining copies of New Literature use the coupon on this page.

204—Safety Directory

Alfred M. Best Co., Inc., 75 Fulton St., New York 7, has announced the publication of the first annual edition of Best's Safety Directory. Specifically issued for safety directors, purchasing agents, plant superintendents and industrial medical personnel the book lists over 1,000 products, devices and equipment used in safety, first-aid, hygiene, health conservation and fire prevention.

The Safety Directory is priced at \$5.00 and may be obtained from the home office of the Best Co. or any of their branch offices located in Atlanta, Boston, Chicago, Cincinnati, Dallas or Los Angeles.

205—Rheem Pamphlets

Rheem Manufacturing Co., 570 Lexington Ave., New York 22, has issued two new pamphlets which describe their latest model automatic stokers and floor furnaces. Stoker capacities range from 10 pounds per hour to 750 while the floor furnaces offer Btu outputs of 17,500 to 35,000.

206—General Electric Controls

General Electric Company, Schenectady offers a new pamphlet entitled "The Importance of Control in Resistance Welding." It discusses the various types of resistance welds and the controls that have been developed to suit the requirements of these welds. Emphasis is placed on the fact that control is essential to the production of a satisfactory weld. Illustrations are by means of both pictures and graphs and clearly show examples of the points discussed.

207—Lungs For Industry

A new product bulletin, fully illustrating and describing the "Lungs for Industry" line of Exhausters, Fans, Blowers and Insulation Blowing Machines has been issued by the General Blower Company of Morton Grove, Ill.

Readers may obtain a copy of the new "Lungs for Industry" product bulletin by writing General Blower Company, 8063 Ferris Ave., Morton Grove, Ill.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

114	115	116	117	118	119
120	121	122	123	124	125
126	127	128			
200	201	202	203	204	205
206	207				

Name
Company
Address

Are you Manufacturer — Jobber — Dealer —

Gleason-Avery, INC.
AUBURN, N.Y.
A RELIABLE NAME IN TEMPERATURE CONTROLS

A TOP QUALITY PARKER-KALON DAMPER CONTROL FOR EVERY NEED



**DIAL
REGULATOR**

Most popular on the market. Unique design prevents air leakage and rattles.



**JIFFY
REGULATOR**

Simplest of all, and simple to install. Low cost.



**UNXLD
QUADRANT**

For 20 years the "standard" for manually operated damper controls.



Ease of installation rates tops on the list of P-K Damper Control features today according to field reports — and that's to be expected with jobs jamming the shops and man-hour costs rising.

But that isn't the only feature of interest to the thousands of sheet metal workers who order these famous control devices regularly. Nor is it the reason why so many architects and engineers specify "P-K".

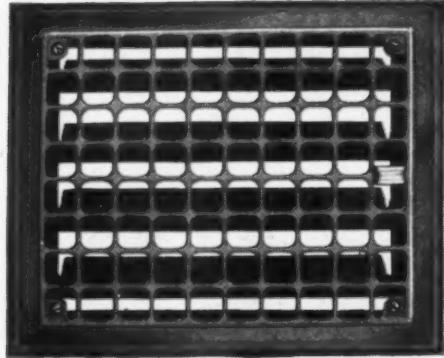
Take a close look at any of the three different P-K Damper Controls. You'll be surprised to see how many features P-K has developed in such

simple little items. Each detail shows careful thought, and plenty of knowledge of what makes a smooth functioning manually operated control. Each part reflects the best of workmanship and materials — the quality for which P-K has always been known.

You know all this if you have been using P-K Controls. If you haven't, try them on your next job and see the difference. You can get them quickly from the P-K Distributor near you. For a handy descriptive folder, write to Parker-Kalon Corp., 200 Varick Street, New York 14, N. Y.

PARKER-KALON

P-K DAMPER CONTROLS
TYPES FOR EVERY JOB



H & C NO. 200 STEEL FLOOR REGISTER

Made in 6 x 8, 8 x 10, 8 x 12, 9 x 12, 10 x 12, 12 x 14.

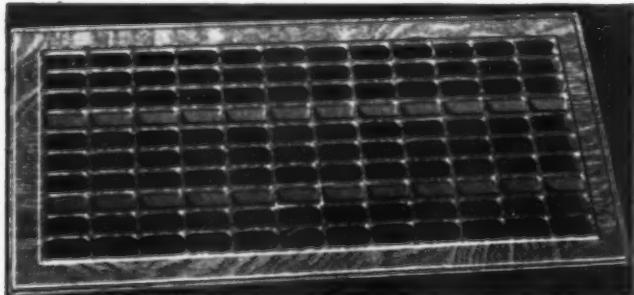
Finishes: Black and Oak.

List prices and discounts same as No. 210 Register.

Your Cooperation is Still Urgently Needed!

In spite of the greatest production schedule in our history the demand for H & C registers remains in excess of our ability to supply promptly. Hence we again urge all our established dealers to accept either No. 200 or No. 210 Floor Registers and either No. 255 or No. 265 Faces in the standardized sizes shown above and below. Nos. 200 and 255, though of comparable quality, can be produced at a much faster rate than Nos. 210 and 265. And consequently, by accepting Nos. 200 and 255 you materially aid us in giving you the maximum number of floor registers and faces in the shortest possible time.

Ask your jobber or write directly to us for a copy of our new catalog No. 46 if you do not have one. It shows our complete streamlined line of registers and furnace accessories.



H & C RETURN AIR FACE NO. 255

Made in 6 x 30, 8 x 30, 10 x 24, 10 x 30, 12 x 14,
12 x 24, 12 x 30, 14 x 30, 16 x 30, 18 x 30, 20 x 30.

Finishes: Black and Oak.

List prices and discounts same as No. 265 Faces.



HART & COOLEY MANUFACTURING CO.
World's Largest Manufacturers of
Registers, Grilles, Furnace Accessories
HOLLAND • MICHIGAN

In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario

With the Manufacturers

In connection with their extensive program of expansion Jackson and Church Company, of Saginaw, Michigan have retained Prof. Loren G. Miller of Michigan State University as special consultant. Widely-known in the field of warm-air heating Prof. Miller brings to this assignment an excellent background of training and experience that will ultimately benefit the consumer by means of improvement in product.



Prof. L. G. Miller

Mr. E. P. Murr of Denver, Colorado will represent Harvey-Whipple, Inc. manufacturers of Master Kraft oil heating equipment, in the Rocky Mountain States area with headquarters in Denver, Colorado. Mr. Murr has long been associated with the domestic and commercial heating industries in those states, is well known among heating men in the mountain area.



E. P. Murr

Sampsel Time Control, Inc. of Spring Valley, Illinois announce the appointment of Edwin C. Dunn as sales engineer. Mr. Dunn will work with the Sampsel sales representatives in furthering the promotion of Sampsel products and supplement their assistance to dealers and jobbers on heating problems.

During the War, Mr. Dunn worked as an engineer for the Army Air Forces at Wright Field, Dayton, Ohio. Prior to the War, he was sales engineer for Curtis' Lighting, Inc. of Chicago.



E. C. Dunn

A. L. Novotny, 6052 Plankinton Bldg., Milwaukee, is announced as Wisconsin sales representative for Sampsel Time Control, Inc., Spring Valley, Illinois. Mr. Novotny is specializing in the sale of various type heating units.

Mr. Novotny is well known to jobbers and dealers throughout the Wisconsin area through fifteen years association with A. J. Lindemann & Hoverson Company and five years with the Automatic Products Company.



KRUCKMAN WASHINGTON LETTER

(Continued from Page 59)

questions which are addressed to Washington, D. C., come to Herbert Krane, Administrator of OPA RMPR 251, and who is in charge of problems involving building installations.

VHP To Be Permanent

In the District of Columbia it is held as assured that the

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**Don't let your customers
struggle through the winter
with cracked Firepots**



**the quick, easy, profitable
way with FIRELINE**

No need to worry about new castings for those cracked, burned-out firepots. Fireline, the plastic, putty-like refractory is the answer. Installed through the furnace door quickly and easily, it seals all cracks and holes in the firepot castings; stops leakage of gas, odors, and soot into the building. By increasing combustion efficiency, it makes the old furnace a better heat producer than ever before! In fact, Fireline is extensively used to increase the heat delivery of new furnaces and to protect good firepots.

In a few hours, you can line any firepot with Fireline; then the fire can be rebuilt immediately. Even in the middle of winter you can repair leaky furnaces. You merely pound Fireline into place with a hammer, trim it smooth, then rebuild the fire right away. When the fire has baked it out, Fireline forms a durable lining that will stand temperatures up to 3,000 deg. F. It is also used for setting stokers, for oil burner combustion chambers, and in steel furnaces for replacing and patching fire tile.

With Fireline you can handle more repair jobs. You save your customers money. You make a higher profit percentage. Write for bulletins, prices, and discount.

Ironset Asbestos Furnace Cement—The high-quality cement for setting up new furnaces and re-cementing old ones. Withstands higher temperatures. Will not crack, shrink, blot, or blister. Makes your work more permanent. Try it on your next job and see how Ironset builds up your reputation for permanent, gas-tight work. You can't afford to use any cement but the best—and that means Ironset.



Fire-Hearth Castable—The ideal refractory for setting stokers, forming pre-cast combustion chambers and baffle tile. Easily installed. Just mix with water, pour into place, and trowel smooth. That's all there is to it.

FIRELINE PRODUCTS
ARE STOCKED BY
LEADING JOBBERS.

FIRELINE STOVE & FURNACE LINING CO.
1816 N. Kingsbury St., (Dept. J), Chicago 14, Ill.

"SELL" YOUR PROSPECTS ON

**Healthful Economical
HEATING**



**WITH
FRONT RANK**

STOKERS

AND BE FIRST IN SALES

FRONT RANK Stokers give more heat from the coal, freedom from trouble, long life and low power consumption. Fully automatic operation throughout the heating season. The thermostat is set at desired temperature and Stoker builds up or decreases the fire in accord with change in the weather. Eliminates waste of overheating. Built to last, FRONT RANK Stokers give heating satisfaction for years to come! Sell FRONT RANK and you build prestige and greater profits for yourself.

FIT ANY FURNACE or BOILER

FRONT RANK Stokers are easy to sell because they are easy to install. They fit any type furnace or boiler.



Model FR4630K

Embodies improved
Transmission guaranteed
for life. Automatic
Air Volume Regulator,
balanced Power Plant. There's none superior!

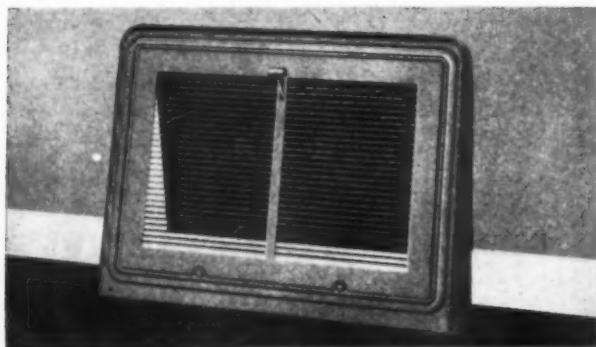
YOU'RE ALWAYS OUT FRONT WITH FRONT RANK—ORDER FROM YOUR JOBBER

FRONT RANK FURNACE CO.

DIVISION OF LIBERTY FOUNDRY CO.
2500 OHIO AVE., ST. LOUIS 4, MO.



SAVE INSTALLING TIME and COSTS with U. S. REGISTERS



No. 40 SERIES **GRAVITY BASEBOARD REGISTERS**

You can cut your labor costs hundreds of dollars a year by standardizing on the U. S. No. 40 Series. Two-piece construction—with removable center—speeds attaching operations, helps secure a tight fit to prevent wall-streaking.



No. 400 **TRUSSTEEL FLOOR REGISTERS**

These heel-proof registers are made with perfectly smooth *seamless corners*—maintain correct areas—perfect smooth operation. Note that multiple valves run the short way for easier operation and cleaner walls.

Send for latest Gravity and Air-Conditioning Register Catalogs.

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

agency headed by Wilson Wyatt strives for permanency, and will become the permanent socialized building control bureau of the Federal Government. Its main efforts at present are reported to be focussed on production and distribution of all things required for veterans' housing, so that materials will be used only for things needed for housing, and the things produced will be distributed only to those who contribute to the housing program.

For instance, it was proposed at a recent all-day meeting of an OPA Committee to freeze warm air furnaces so the distributor and dealer can only sell them to those whose contracts are solely concerned with Wyatt's housing program. The effect of such proceeding upon the general economy, and the chaotic confusion which would inevitably follow the dislocation, apparently is ignored or not perceived by the Master-minds.

This prospect, and other matters vital to the industry, are to be discussed here during a two-day meeting of the old Industry Advisory Committee early in October. The Committee has an appointment at the White House, and is expected to tell the President some "Facts of Furnace Life" which he obviously has not heard from the Wyatt school of housing economists. There are serious equations of steel supply, and the problems connected with fractional horsepower motors.

In theory the warm air furnace industry is presumed to get 225,000 motors the last six months of this year. Next year, the hope is dangled, they will get 500,000 motors with their potential production, according to Capital estimates of 1,000,000 furnaces.

Incidentally, the man who has kept more balance in the situation on the Government side of the fence than any other official, Morgan N. Johnston, quits the OPA permanently, after four years of emergency service, which began early in the war in WPB. Johnston leaves October 4, and will have his own business, with establishments in Baltimore and Washington.

Sheet Export

The steel and iron sheets exported to Good Neighbors during July, (the last figure available), totaled 6,000 tons. Steel sheets supplied 5,400 tons, iron sheets, 600 tons. This constitutes 4½% of the nation's supply. The monthly exports for the first six months of 1946 see-sawed between 6,000 and 7,000 tons each month, or an average of 5-3/10% monthly for the period. The bulk of this sheet metal has gone to Mexico and to other Latin American countries. A considerable volume is increasingly being shipped to the Philippines.

It is the theory of the Washington administrators of the export controls that we must give the Latin Americans what they want because we need their friendship. This has the enthusiastic support of the president, who emphatically believes we should foster an economic and military unity with our hemispheric neighbors. Canada gets approximately 8% of the sheet metal exports. The word is that our neighbors to the North and the South have great need for material to make flashings, termite shields, gutters, and similar products. The housing program under Mr. Wyatt gets 15% of the sheet metal produced; the other 85% goes to automobile manufacturers, railroads and similar users. Sheet metal has never been withdrawn from export control, and there does not appear to be any immediate prospect that the export control will be cancelled.

Rural Electrification

The presumption here is that REA will expand the supply

(Continued on Page 118)

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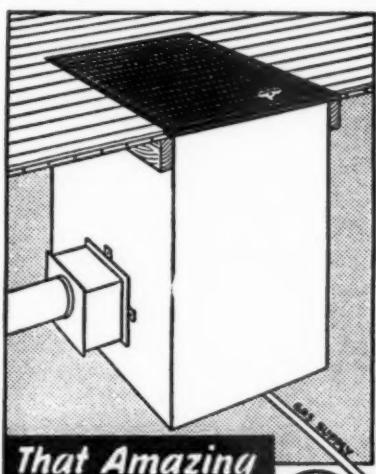
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It Can't Be Beat!



That Amazing
JOHN ZINK
FLOOR FURNACE



The floor furnace that features EFFICIENCY, QUIETNESS, DURABILITY, and ECONOMY! Due to better construction it doesn't pop or rattle when heating up or cooling off.

It is easily installed and easily cleaned from the top. All four popular sizes are reasonably priced.



John Zink and his engineers manufacture Gas Burners, Oil Burners, and Combination Oil and Gas Burners for: Domestic Boilers, Heating Boilers, Industrial Boilers and Power Boilers. We are willing and capable of designing and manufacturing special burners for special purposes.

Write for Literature

John Zink Company

4401 South Peoria

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New York - Detroit - Salt Lake City - Houston - Los Angeles

You Name it . . . They Drive it



**Self-Tapping
Screws • Wood
Screws • Machine
Screws • Nuts
and Bolts**



B & D POSITIVE CLUTCH SCRUGUN speeds up production on such jobs as fabricating air conditioning ducts.

ADJUSTABLE CLUTCH SCRUGUN . . . one of many Black & Decker models . . . automatically drives screws and nuts to uniform tension.

Black & Decker Electric Screw Drivers and Nut Runners speed up every type of sheet metal assembly work . . . from the most delicate screw driving operations to driving and tightening nuts and bolts up to 1" diameter or lag screws up to $\frac{3}{4}$ " x 6". Light, compact, easy to handle . . . these powerful tools insure top-speed performance with greater accuracy and uniformity and minimum operator fatigue.

For full information about all models . . . and other Electric Tools for heating, piping and air conditioning work . . . see your nearby Black & Decker Distributor. For your free copy of our 60-page, illustrated "Power Assembly Tool Data Book," write to: The Black & Decker Mfg. Co., 682 Penna. Ave., Towson 4, Md.

LEADING DISTRIBUTORS  EVERYWHERE SELL

Black & Decker
PORTABLE ELECTRIC TOOLS



ELECTRIC DRILLS



ELECTRIC SHEARS



BENCH GRINDERS



WIRE BRUSHES

(Continued from Page 61)

Agent's demand:

*10 baskets of 50 apples each	
at 3c an apple.....	\$15.00
Pete's wages—8 hrs. x \$2	
per hr.	\$16.00
Cost of baskets and	
marketing	2.75 18.75

Uncle John would
lose each day.. \$ 3.75

Uncle John asked the OPA
to raise the price of each apple
from 3c to 4c, which would give
him a profit of \$1.25 per day
instead of a loss of \$3.75 per
day.

The OPA investigated care-
fully because it didn't want any
inflation in the apple business,
and finally agreed to allow
Uncle John to raise the price of
each apple to 3½c (provided
Uncle John made a satisfactory
deal with Pete) which meant
that Uncle John would only lose
\$1.25 per day.

When Uncle John refused
to accept the 3½c price per
apple and pay Pete \$2 an hour,
the Union Agent said Pete had
better strike since it was ob-
vious Uncle John was out to
smash the Union.

Uncle John said all he wanted
to do was to make a fair profit,

and it was O.K. with him if Pete
stayed in the Union.

Then the Union Agent went
to Washington and told the
Government to force Uncle John
to pay Pete \$2 an hour, and
the Government called Uncle
John to Washington and told
him that he ought to pay Pete
at least \$1.85 per hour.

In 1945, after the Govern-
ment stepped in:

*10 baskets of 50 apples each	
at 3½c an apple.....	\$17.50
Pete's wages—8 hrs. x \$1.85	
per hr.	\$14.80
Cost of baskets and	
marketing	2.75 17.55

So Uncle John would
only lose each day.... \$.05

*NOTE—Actually this figure of 10
baskets a day is inaccurate,
for, after Pete joined the
Union in 1942 his daily pro-
duction dropped to 8 and
even 5 baskets a day. How-
ever, Uncle John was not
permitted to introduce this
evidence into the wage dis-
cussions since the Union main-
tained that Pete could pro-
duce 10 baskets a day if he
FELT like it.

But Uncle John held out for
paying Pete \$1.80 an hour in-
stead of \$1.85 an hour which
was only a difference to Pete of

5c an hour, but it meant that
Uncle John could make a profit
of 35c per day, before taxes,
(provided Pete went back to
picking 10 baskets a day) in-
stead of losing 5c per day.

Both the Government and
the Union Agent said that if
Uncle John was going to quib-
ble about paying a lousy 5c per
hour it certainly showed that
Uncle John was anti-labor and
was out to wreck the Country.

Uncle John said that he was
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that he didn't see how he could
hire Pete very long if he lost
money every day that he did
hire him.

At midnight (because strikes
usually start at midnight) Pete
went out on strike.

The apples lay on the ground
until they rotted.

Neither Uncle John nor Pete
made any money.

A lot of people began to say
they liked oranges as well as
apples.

Pete and the Union Agent
went down to Florida to see
about that!

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Republic Steel Corp., Cleveland

TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Tri-
angle engineers for
fans, blowers and
other devices re-
quiring silent oper-
ation, perfect align-
ment and self-lubri-
cation.



Preloaded oil-proof
cushion built into
the bearing.
Ball-and-socket de-
sign.
Write for samples
and complete in-
formation.

**Over a third of a Century
FAITHFUL PERFORMANCE**

Listed by
Underwriters' Laboratories, Inc.
To Burn No. 3 Oil
(Diesel) or lighter



KRESKY offers future profits to DEALERS

A pioneer among oil burners Kresky finds such an unprecedented demand today that we are forced to limit shipments to old established dealers. Nevertheless new franchises are being granted now to farsighted dealers who see in Kresky's present oversold condition the promise of future opportunity. ★ The versatile Kresky line is a year round money maker due to its wide applications—heating, cooking and industrial. It includes Conversion Burners, Floor Furnaces, Forced Air Units, Range Burners and Water Heaters. Write for Kresky Dealer Plan.

HEATING • COOKING • HOT WATER • INDUSTRIAL



KRESKY MANUFACTURING COMPANY

Pioneers in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA



WE'RE WORKING HARD
TO KEEP UP PRODUCTION



WE'VE PLENTY OF SOME
MATERIALS, OTHERS ARE
HARD TO FIND

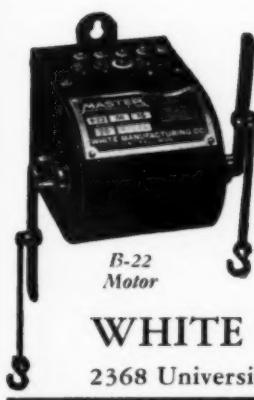


WE'RE DOING OUR BEST TO
ALLOCATE OUR PRODUCTION
FAIRLY— AND ALL OF OUR
CUSTOMERS ARE GETTING
CONTROLS

MASTER
TEMPERATURE CONTROLS

FOR over a quarter of a century, "White" has been a distinguished name in the heating industry. Master Temperature Controls are famous for their greater comfort, more efficient service and longer life... factors which insure complete satisfaction for your customers and growing sales for you.

Our Standard Products



B-22
Motor

Including those illustrated on this page, are coming off the production line in increasing quantities,—we are now approaching the volume that our customers and we wish for.



A-23
Plain
Thermostat

WHITE MANUFACTURING CO.

2368 University Ave.

St. Paul, Minn.

(Continued from Page 61)

Agent's demand:

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TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Tri-
angle engineers for
fans, blowers and
other devices re-
quiring silent opera-
tion, perfect align-
ment and self-lubri-
cation.



TRIANGLE MANUFACTURING CO.

392 DIVISION STREET

OSHKOSH, WISCONSIN

Over a third of a Century FAITHFUL PERFORMANCE

Listed by
Underwriters' Laboratories, Inc.
To Burn No. 3 Oil
(Diesel) or lighter



KRESKY offers future profits to DEALERS

A pioneer among oil burners Kresky finds such an unprecedented demand today that we are forced to limit shipments to old established dealers. Nevertheless new franchises are being granted now to farsighted dealers who see in Kresky's present oversold condition the promise of future opportunity. ★ The versatile Kresky line is a year round money maker due to its wide applications—heating, cooking and industrial. It includes Conversion Burners, Floor Furnaces, Forced Air Units, Range Burners and Water Heaters. Write for Kresky Dealer Plan.

HEATING • COOKING • HOT WATER • INDUSTRIAL



WE'RE WORKING HARD
TO KEEP UP PRODUCTION



WE'VE PLENTY OF SOME
MATERIALS, OTHERS ARE
HARD TO FIND



WE'RE DOING OUR BEST TO
ALLOCATE OUR PRODUCTION
FAIRLY—AND ALL OF OUR
CUSTOMERS ARE GETTING
CONTROLS



KRESKY MANUFACTURING COMPANY

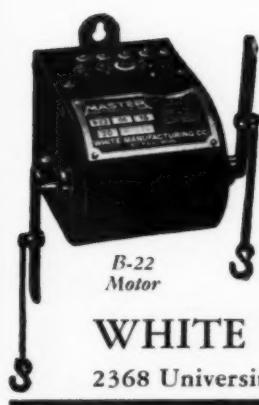
Pioneers in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA

MASTER TEMPERATURE CONTROLS

FOR over a quarter of a century, "White" has been a distinguished name in the heating industry. Master Temperature Controls are famous for their greater comfort, more efficient service and longer life... factors which insure complete satisfaction for your customers and growing sales for you.

Our Standard Products



Including those illustrated on this page, are coming off the production line in increasing quantities,—we are now approaching the volume that our customers and we wish for.



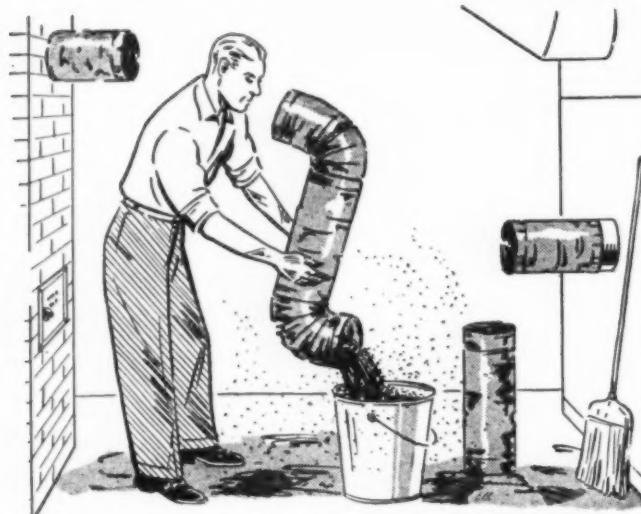
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WHITE MANUFACTURING CO.

2368 University Ave.

St. Paul, Minn.

IS THIS NECESSARY?



VITROLINER BREECHING PIPE

ELIMINATES THE EXPENSE AND BOTHER OF FREQUENT REPLACEMENT

VITROLINER is a new breeching pipe for connecting heating plant to chimney. VITROLINER BREECHING PIPE will give many years of trouble-free service. A complete line of fittings makes any hookup possible and can be easily and quickly installed. VITROLINER eliminates the fire hazard of corroded pipe. VITROLINER is made of heavy gauge steel completely coated inside and outside with porcelain to prevent corrosion. VITROLINER'S porcelain finish is attractive and adds to the beauty of any room.

SPECIAL FEATURES: The Telescope section is adjustable in length and is used to fill in any odd length now accommodated by standard lengths. The Vitroliner damper section has a cleanout hole covered with a sliding sleeve.

VITROLINER CHIMNEY LINER

VITROLINER is an acid resisting chimney lining which can be installed in existing chimneys, easily and quickly. VITROLINER prevents chimney deterioration caused by acids in the flue gases. VITROLINER will catch the acid condensate and drain it away with no harm to the brickwork.

VITROLINER has been used for the past 16 years and is proven through a long field record.

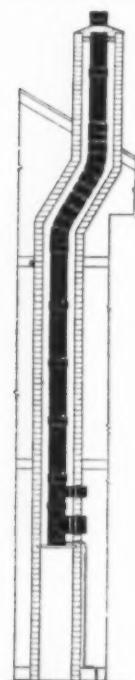
VITROLINER chimney lining is heavy gauge steel, double coated inside and outside with acid resisting porcelain fused into the steel at 1575° F.

VITROLINER will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT.

Write for further details and circular.

**CONDENSATION
ENGINEERING CORPORATION**

122 So. Michigan Ave., Chicago 3, Ill.



KRUCKMAN

(From Page 112)

of current among farmers as quickly as it can adjust its facilities. It has had much voltage trouble. It is now engaged in devising means of providing more sub-stations, of readjusting its facilities, and in shifting the center of lead. It plans to spend 1/3 of the original outlay to renovate its systems. The single-phase distribution-wiring is rapidly being changed to multi-phase lines. The object is to organize a better balanced system, to use what is now available to supply more farmers, not to build new systems. REA itself is rapidly assuming the status of a permanent integer of the government economy, which is contrary to the original program. REA wishes to establish more cooperatives, while apparently the existing cooperatives wish to encourage consolidation of the present resources and facilities. There is much reason to assume that REA will strive vigorously to grab a substantial part of the market in the 3,000,000 unelectrified farms.

Furnace Prices

The recent announcement by OPA that re-sellers of warm air furnaces, as well as floor and wall furnaces, would be permitted to increase their price ceilings, and that the prices paid by the ultimate buyer would increase from one to three per cent, means that the re-seller pays from one to three per cent more, and that the manufacturer is permitted to charge from one to three per cent more for his product, always providing, however, that the increases are superimposed only on the price structure as it existed AFTER March 31, 1946. The permission to increase applies to the various individual price-increase concessions allowed to manufacturers, as well as the blanket increases which were announced at different times.

Re-sellers, in the meaning of OPA, are contractors and jobbers.

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→ Investigate the advantages of HESS Equipment — backed by 73 years of Heating and Ventilating Experience

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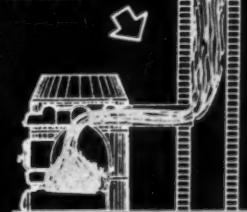
THE Field
DRAFT
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GATE BALANCED
AT FACTORY
MADE OF HEAVY
MATERIAL
DOESN'T CLOG
OR WARP
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HINGE PIN
QUICKLY
RESPONSIVE
FREE SMOKE
PASSAGE

CONTROLS
THIS DRAFT
TOO

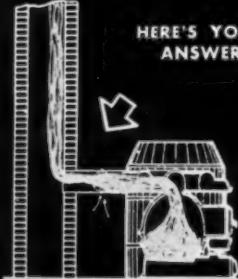


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PROBLEM



Excessive, uncontrolled chimney drafts waste up to 25% of the fuel burned in nine plants out of ten!

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ANSWER



A FIELD DRAFT CONTROL holds drafts to a minimum, provides fuel savings ranging up to 25%!

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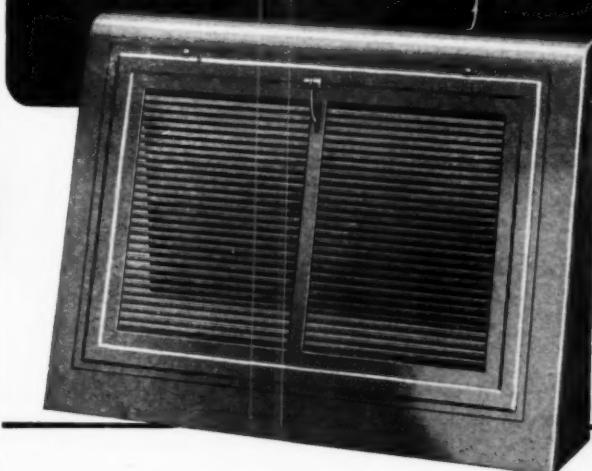
● When a heating plant performs BADLY, the owner SQUAWKS . . . but LOUDLY! The product is 'lousy'; the dealer is a crook! Yes, word-of-mouth advertising work BOTH WAYS. And the pity is that the heating plant may be a beautifully engineered job, lacking only proper draft control for perfect operation. Good, inexpensive, trouble-free insurance AGAINST this type of bad publicity is a FIELD BAROMETRIC DRAFT CONTROL on every installation. But be sure you install a FIELD. Remember this: Leading heating equipment manufacturers, with facilities to test and re-test every draft control made, have picked FIELD as standard equipment.

"See our exhibit at the 7th International Heating and Ventilating Exhibition, Lakeside Hall, Cleveland, O., Jan. 27-31, 1947, Exhibit No. 25."

Field

INDEPENDENT Baseboard Registers

with
Bendable Fins



No. 92 Two-piece, with removable grille

★ The simple artistic lines of this register express streamline design at its best and harmonize with the furnishings of the modern home. Fins are regularly set to deflect air flow slightly upward; but being easily bendable, they can be adjusted to direct air flow straight outward or downward, as required. Scientific design affords large open area with minimum air resistance.



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Trouble-free, fully automatic heater hangs from ceiling. Requires no floor space or duct work. Delivers maximum heat with whisper quietness. Rugged, handsome case finished in brown crackle enamel. Every heater tested before delivery.

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For natural or Butane Gas.

100,000 BTU size now in production

Write for catalog and ask to
be placed on our
mailing list

Palmer
MFG. CORP.
Phoenix, Arizona

Panel Heat Konzo

(Continued from Page 71)

For the present, at least, we find contractors and architects using heavy concrete slab floors. The experience that we have gathered or rather, the results of experience have been very conflicting. We have seen reports from a number of installations, and we have had results that were highly satisfactory, running all the way to very bad. We have been very much interested as to what the troubles were in some of these jobs.

The trouble, apparently, is in this mass of heat that you have stored in your concrete slab. To my notion, a concrete slab floor using some form of panel heating should not be used under certain conditions. Any condition where you require rapid change of temperature indoors; for instance, if you have a heavy concrete slab, I think it is absolutely fatal to advise the house owner to use a night set-back in temperature. If he does, he will never get this house warm in the morning, and it takes too long. We have had reports coming from such installations in which it has taken anywhere from twelve to fifteen hours to heat the room in winter. Once heated, it takes twelve to fifteen hours to cool it off again.

The other application which I think should not be used with the panel heating is a combination of panel heating with solar heating. I believe that you have read consumer magazines and have seen a lot of trade journal arguments about solar heating. Solar heating in essence, consists of a house with a large amount of window area facing the south, with

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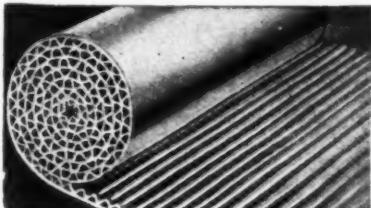
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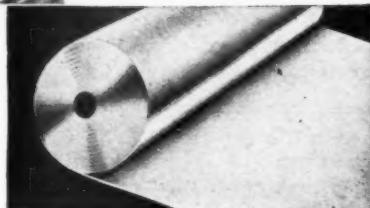
NO. 299 RING AND CIRCLE SHEARS . . . CAPACITY NO. 20 GAUGE SOFT STEEL.
DIAMETERS CUT, 3½" TO 42½".

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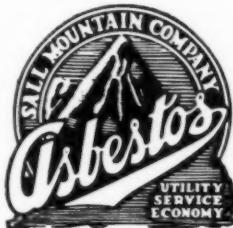
For insulating hot air pipe, gas ovens, range boilers and other surfaces exposed to heat. Protects surfaces from rust and corrosion.



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Made in smooth, strong white sheets from the best grades of selected asbestos fibre. Specially processed to insure efficient insulation. In all standard weights and widths.

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An Asbestos Product for constructing ducts in warm air heating, ventilating and air conditioning systems. Made of solid Asbestos. Light in weight; fireproof and moistureproof. Easily handled and applied. 33x48 sheets.



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an overhanging eave to cut off the sun's rays in the summer time and yet not so far out that it will not permit the winter sun to come in the rooms.

It definitely tries to utilize the radiation effects from the sun in the winter time as far as possible. There were two experiments, one at Rockford and one at Kansas City, I believe, that go to prove that the combination of a solar type house, where you have large exposures on the south side, combined with a heavy mass slab floor, heated by means of a panel system, simply do not go together, because each will accentuate the other and will produce results not entirely acceptable under any conditions.

Heat Comes Up With Sun

In the first place, you must realize that when the sun's rays do come out, the result is instantaneous. The temperature begins to rise within the matter of a second or so. We have results reported from one house in which the temperatures that were maintained at night time were considerably below a comfort point, and when the sun came out, it shot up to ninety-three degrees. That, to my notion, is not heating. It is heating all right, but I would say it is broiling, and nothing is going to help that except a very flexible system, one in which you heat up the least amount of mass, and I think the only answer to the solar type house, is some form of heating where you heat nothing but the air and do the least amount of heating that you can of the material of the house itself, because the results obtained in those houses, certainly have not been satisfactory.

That is one case in which the slab type of heating of any type should not be used. I think there is one other point that should be brought out, and that is the importance of the

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Wayne's complete sales program is thorough in every selling detail with more sales help than you will need.

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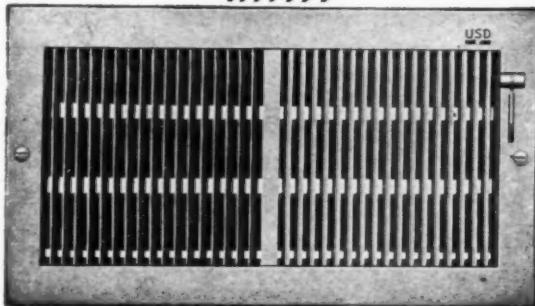
Write for Details of the Wayne Dealer Partnership Plan

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4-WAY DIRECTION in a medium-priced REGISTER

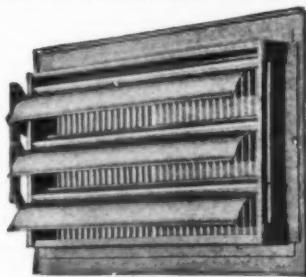
AIRO-FLEX
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No. 4432

Auer Airo-Flex Registers provide effective 4-way directional flow. Multi-louvre back blades control up-and-down flow, and indicator on face shows position of blades. Hand lever operates readily, but holds deflectors permanently in position. Vertical grille bars are easily adjustable for straight or side-way deflection with turning tool. The Airo-Flex design has all adjustable features of many higher priced registers. Furnished for wall or baseboard use with matching intake.

- Many other types of Auer registers for both air conditioning and gravity systems shown in Auer Register Book, sent on request. For flat stamped metal grilles, ask for Grille Catalog.

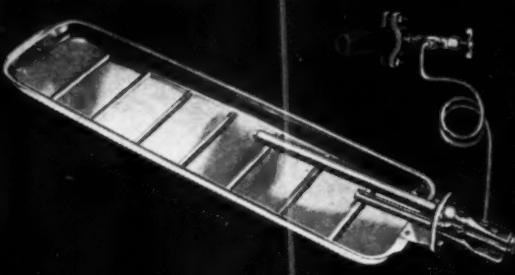


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AUER
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For Air Conditioning and Gravity

THERMO-DRIP
HEAT REGULATED
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No furnace installation is really complete unless it meets your customers' demands for true healthful comfort. When you install Thermo-Drip Humidifiers on furnace jobs whether old or new, you make them tops in efficiency because Thermo-Drip Humidifiers moisten the air as it is heated in direct proportion to temperature. Thermo-Drip Humidifiers provide healthful comfort for sure! Manufactured of the finest materials, designed and engineered for simple installation, Thermo-Drip Humidifiers make any furnace completely efficient for correctly balanced humidification. Write us today for details.

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Your furnace-user friends will thank you later — if you urge them *now* to install a new A-P DEPENDABLE Heat Regular Set on their coal fired furnaces.

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The new A-P Heat Regulator Set — precision-built for years of DEPENDABLE service — is available for steam, hot water, or warm air heating systems. It is complete with modern wall Thermostat, Limit Control, Damper Regulator, Transformer, and complete installation kit, with full instructions for easy installation.

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FOR HEATING • AIR CONDITIONING • REFRIGERATION

floor construction, as far as panel heating is concerned, and as far as any type of heating is concerned, in these basementless houses. Basementless houses first came into the picture when contractors in their attempts to cut costs had the novel idea that all you had to have was a floating slab. In other words, here was the ground. They scraped off a little of the top dirt, put it out in the garden and then put in a floating slab of that type, probably six inches of concrete.

Some of them even provided a little gravel and put a very shallow edge effect there. The whole thing was practically floating on the ground. That construction apparently met with success in certain sections of the country and in others it produced horrible results. The Bureau of Standards has published a report that I think was quoted in some of the trade papers, that pointed out the fact that with this type of construction, where you will start your buildings, your walls, right directly above the concrete, that you have a tremendous edge effect.

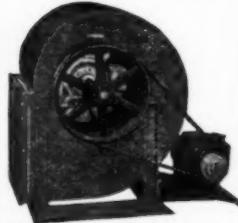
Edge Problem

In other words, the heat loss outwards along the outside periphery of that wall was huge, and an amount as much as twenty-five or thirty per cent of the entire heat loss of the house. In construction of that type, therefore, they had great difficulty in heating the houses, and maintaining comfortable conditions, regardless of what they put into the house. They had high fuel bills. They had cold floors extending in three, or four or five feet around the entire periphery of the house. The Bureau of Standards' tests have therefore definitely indicated that the footing of the outside wall should be separated from the floor itself, by some means of edge insulation.

A number of solutions have been offered, running all the way from one inch cork board to one inch solid brass brick

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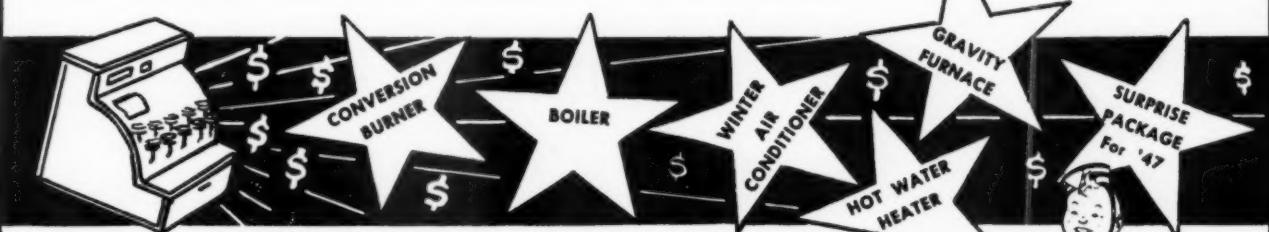


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This complete NORMAN Profit Line is out in front in new features and engineering developments that spell more profits for NORMAN Dealers.



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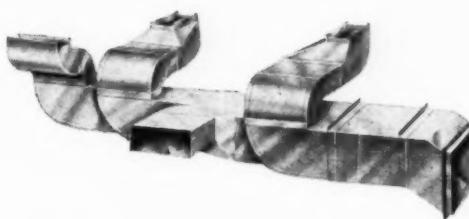
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tile. Some have used asphalt or celotex type of insulation. Regardless of what you use, the material that is in there should be at least one inch, preferably asphalted or waterproofed adequately to prevent the moisture from getting in and should be fairly rigid so that it will not be compressed when the concrete is laid against it.

If you don't have this safeguard, you are going to have trouble. Another item that has crept into the picture that has been discovered as being important, has been the possibility of a vapor travel from the ground up through into the floor itself. One man recently made a trip to New York, Cleveland, and Chicago, talking to contractors, and he reported back to us that he found very different approaches are being recognized, but they all accept the fact that we dare not lay concrete directly on clay. We have a very high heat transmission down through the clay. We also have the possibility of getting moisture travel from the clay, directly into the concrete, and evaporation and condensation and all of its accompanying evils, at various times of the year. Consequently, it is necessary to break the bond between that concrete under-surface and the clay, by some means of filling.

The various contractors are approaching it in different manners. I would like to give you a summary of what most of them are thinking about. Most of them feel that the ideal method of doing this at the present time is to put down six inches of gravel, some say cinders, some say Haydite aggregates, some say slag. Whatever it is, it is light, porous material that will take up the spaces between, so that the moisture cannot be conducted to the underpart of the concrete slab.

Then they say, put down heavy asphalt coated paper, preferably what they call tarred, along the edges, on top of which they put another thin coating of gravel, followed by a layer



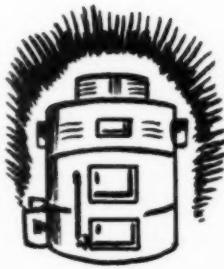
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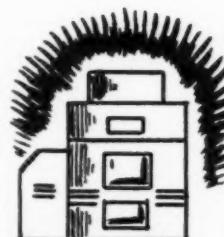
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*the FURNACE CEMENT that
has met all the tests of
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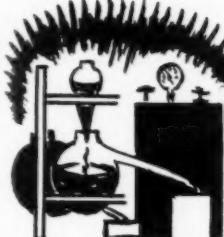
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At the shop — on the job — you'll pick up many extra dollars when you use these proven Crise sales tools.



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W.A.
WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

of concrete. That seems to be the present opinion. Whether that is necessary, or whether that is going to be adequate or not, we don't really know, but certainly the experience obtained has shown that the nature of that floor construction is going to either make or break your system. I don't care what kind of system you have, panel heating or otherwise. If you do have a panel heated job, and you have a very poor side wall edge condition, you are going to have heat losses twenty, or thirty or fifty per cent greater than you have ever had in houses of similar size. You are going to have cold floor effects extending at least three feet from the outside.

You may have ice formed under the outside wall during the cold weather. You may have condensation formed. This matter of floor side construction and floor construction is of importance. Unfortunately, we, with our limited data, cannot give you any so-called absolute recommendations. We can only transmit to you what the various architects and engineers are thinking about. Those are some of the highlights of the matter of panel heating.

Warm Air Panels

I would like to point out to you the possibilities of panel heating with warm air. One company, the International Heater Co., has probably pushed panel heating warm air systems far more than any other.

In the International system, a duct goes up into a ceiling space, and the air circulates through the ceiling spaces, a false ceiling, back into the furnace again. It is a hundred per cent closed system. In other words, none of the air gets into the room. In a design for a ceiling surface temperature of the order of a hundred fifteen degrees or so, they have heat releases in the order of seventy-five or eighty Btu per square foot of ceiling surface.



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SMOKE PIPE



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FITTINGS

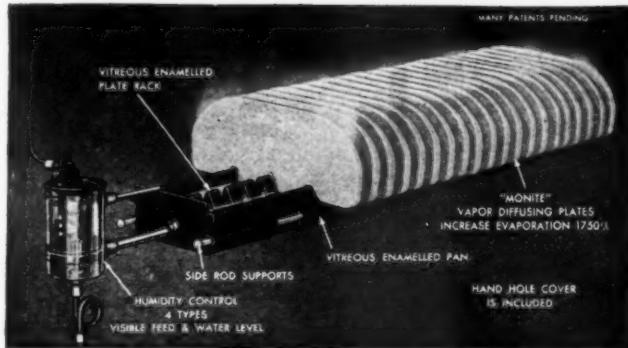
See for yourself how MADE-RITE's "one-stop" source of supply helps you to more money and better installations. Precision manufacturing of Furnace Pipe, Duct Work, Smoke Pipe, and Fittings is the big reason for our established reputation. We'll help you select the right pipe or fitting for the job . . . and can, in most cases, supply ALL your needs with parts that will FIT the first time.

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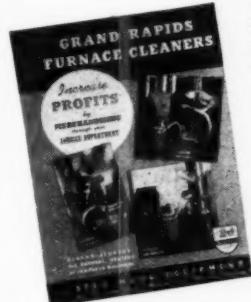
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THE CLEVELAND HUMIDIFIER CO.

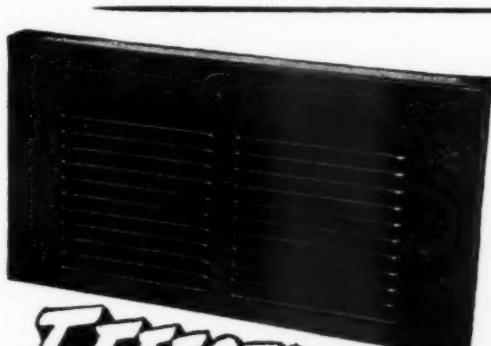
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Large Inspection Door and frame may be mounted at any location on the furnace bonnet.



Length of pan sizes are 12", 16", 20", 24" and 28". Fully adjustable to fit odd sizes.

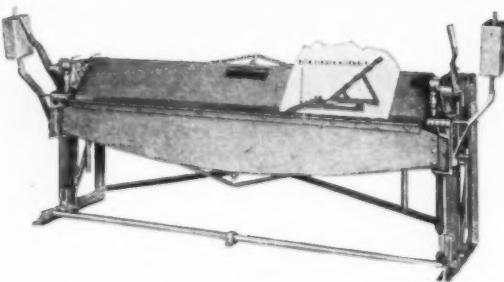
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Will cut, notch, and bend all sizes of angle iron through 2" x 2" x 1/4".

weight—225 lbs.

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Consequently, if you have one thousand square feet of ceiling surface, you can have a heat loss as high as seventy-five thousand, and still be able to meet the requirements. That is one approach. There are, however, a number of other approaches, and we would like to try them in the new Warm Air Research residence. To my notion, if you could have the best features of a straight forced air system with the best features of the panel system, it seems to me you may have a final end result, you may have a final system, that is far superior to either, and I would like to propose it to you.

It is nothing new; it has been done before. I would like to bring it before you, for your consideration. If some of you run into a place where you can try this, you might try it and report back to us on it. We might try it in the residence. Let's assume for the sake of argument, that we have an air channel in which the heated air comes below the floor surface and then it is emitted into the room through slots of some kind or other in the floor.

It comes out from the window sill or some place else. That has been worked out in detail. We have made calculations that it is perfectly feasible to keep this temperature definitely below eighty-five, let's say seventy-five or eighty degrees—so that we have a minimum temperature difference between this floor and the air.

In other words, we are not trying to store too much heat in there and you store the least amount of heat when you have the least temperature difference between that floor surface and the air temperature itself. A five degree difference between air at seventy and a floor surface at seventy-five is not as serious as a fifteen or twenty degree difference.

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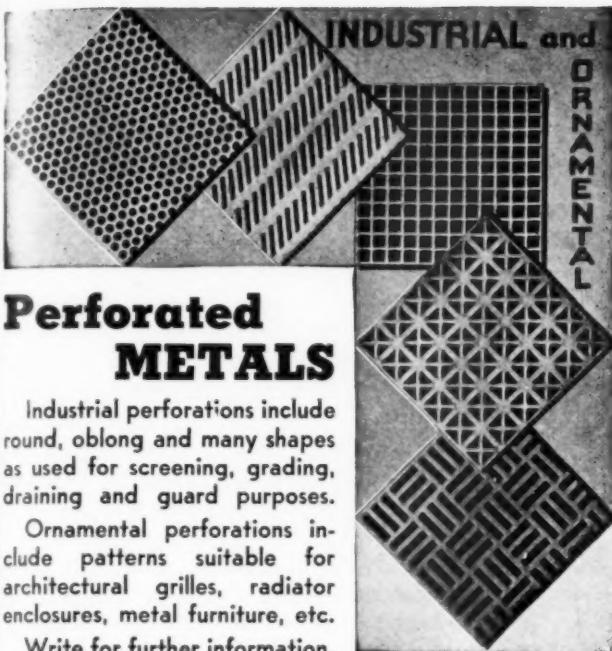
—Calendar dial . . . providing individual daily settings for weekly schedules with holiday and Sunday shut-off and advanced time cut-off Saturday noon. 6" clear line 7-Day calendar dial calibrated to hour and half hour markings. 14 adjustable rider type trippers, thumb screw set, standard.

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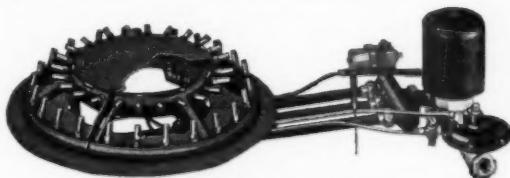
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Listed in A.G.A. Directory of Approved Appliances. Ask for catalog and prices on conversion burners, appliance burners, and pressure regulators.

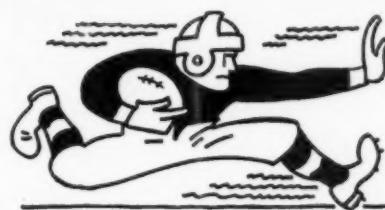
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for Furnaces, Boilers and Appliances

BOTH Star Performers



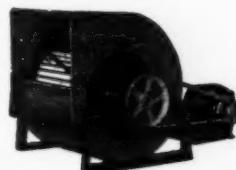
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BLOWERS

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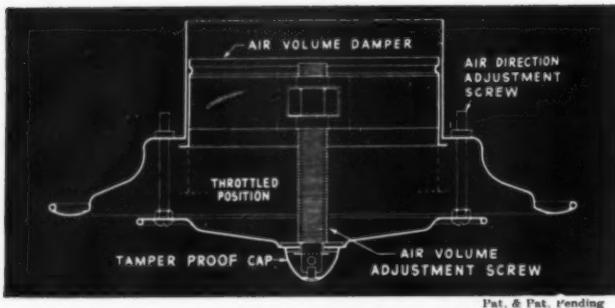
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of a floor panel which is a slightly heated floor and overcome one of its main difficulties. If you have heat at seventy-five or eighty at the most, and let the air come in here from eighty-five to a hundred and fifteen, we could get a combination of convection plus panel heating, that to my notion would overcome the handicaps of existing panel jobs and give you the benefits of it, and at the same time, give you the benefits of air circulation.

I would like to point out to you some of the possibilities in the heating field, in view of the very great public interest in panel heating. Some of you are going to say, "I have spent all my life trying to learn about forced air and gravity heating, and now I have to learn it all over again."

The only encouragement I can give you is that, first of all, by all means, learn how to calculate heat losses and Btu, because if you learn that method, it will be applicable to panel heating or any other system. The second thing I would like to offer to you is the fact that heating alone is not the whole answer, as far as comfort is concerned.

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Air conditioning, as you know, is more than heating, more than a matter of raising temperatures up to a certain point. It is supposed to be a matter of providing clean, healthful air.

As engineers, we want to control heat leakage. The warm air system, however, has one feature that the others are going to have a hard time overcoming. That is a means of providing ventilation of air, and I think that fact should be emphasized and should be introduced certainly into the quality type construction.

Ventilation air should be introduced, maybe not in large quantities. It may be by means of a six inch pipe, and only consist of fifteen or twenty per cent of outside air. It



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The BARNES BETTER BILT GAS FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace size—then presto! it goes in easily and with a minimum of muss or fuss.

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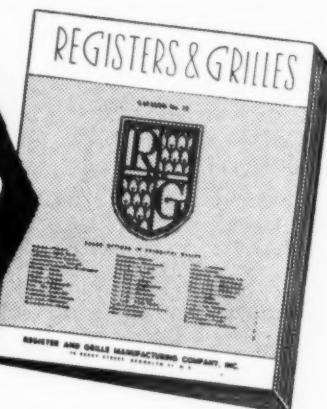
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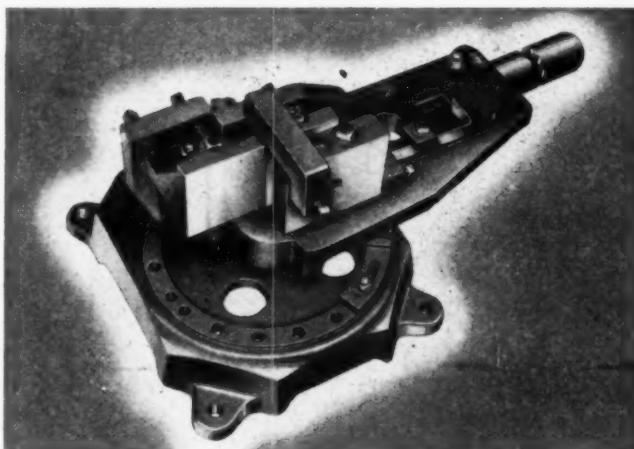
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should be introduced so we can overcome the present handicaps we have of watching cigarette smoke rise up to the five foot level and simply stay there.

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I would like to summarize this entire situation by telling you that panel heating properly applied, has its place in the picture. It can be done by hot water, steam or warm air. There are probably more flexible arrangements with warm air systems than with either of the other two.



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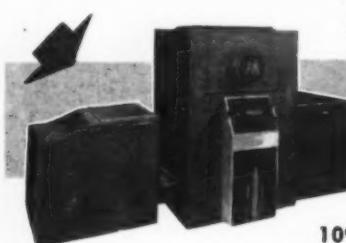
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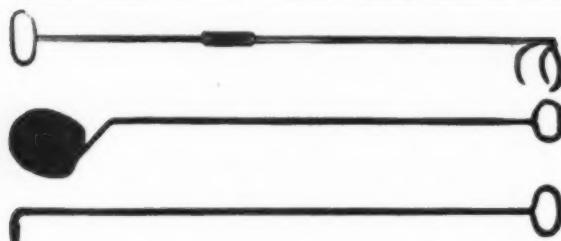
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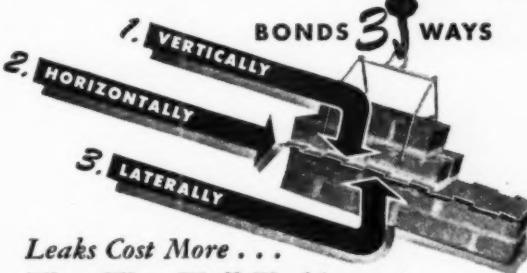
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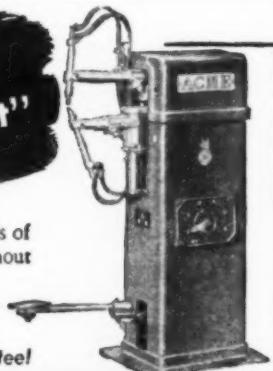
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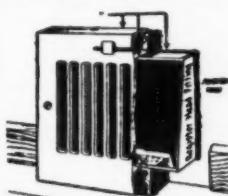
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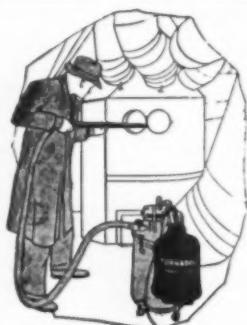
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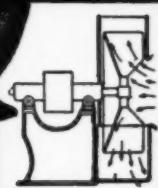
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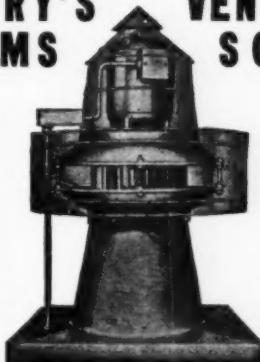
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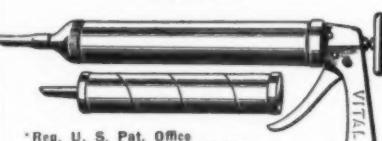
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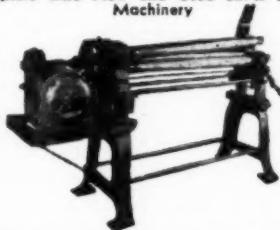
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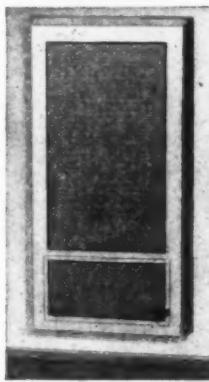


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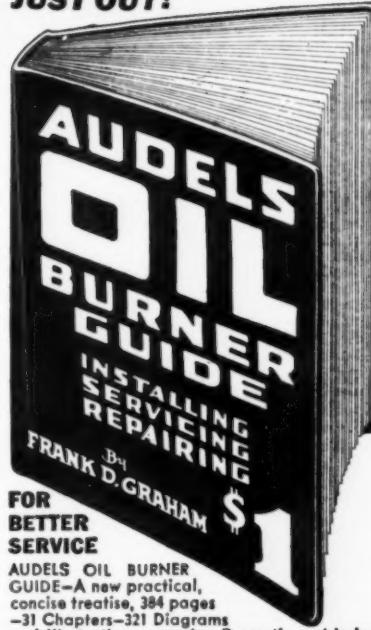
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Index to ADVERTISERS

Acme Electric Welder Co.	134	
Acme Equipment Company	*	
Adams Co., The	132	
Adams Mfg. Co.	*	
Aerofin Corp.	*	
Air Controls, Inc.	129	
Air Controls Products, Inc.	*	
Air Devices, Inc.	*	
Airtemp Div. of Chrysler Corp.	100	
Airtherm Mfg. Co.	*	
Allen Co., Inc., L. B.	136	
Allied Building Credits, Inc.	50 & 51, 90, 107	
American Brass Co.	53	
American Monorail Co.	42	
American Radiator & Standard Sanitary Corp.	*	
American Rolling Mill Co., The	92	
American Smelting & Refining Co.	*	
Anchor Post Products, Inc.	*	
Anemostat Corp. of America	*	
Armstrong Co., The	124	
Audel & Co.	139	
Auer Register Co.	121	
Automatic Humidifier Co.	121	
Automatic Products Co.	122	
Bacharach Industrial Instrument Co.	136	
Badger Corp.	*	
Barber Gas Burner Co., The	129	
Barnes, Inc., H. C.	130	
Barth Mfg. Co.	129	
Barton Co.	99	
Bayley Blower Co.	134	
Berger Bros. Co.	132	
Bethlehem Steel Co.	101	
Beverly Shear Co.	134	
Bishop & Babcock	*	
Black & Decker Mfg. Co.	113	
Brauer Supply Mfg. Co., A. G.	134	
Bremil Mfg. Co.	134	
Breuer Electric Mfg. Co.	136	
Brundage Co.	130	
Bryant Heater Co.	93	
Burden Co.	*	
Carnegie-Illinois Steel Corp.	45	
Century Electric Co.	*	
Char-Gale Mfg. Co.	123	
Cheney Inds.	135	
Cherry Rivet Co.	*	
Clarage Fan Co.	3	
Clayton & Lambert Mfg. Co.	Inside Front Cover	
Cleveland Humidifier Co.	127	
Cleveland Steel Products Co.	97	
Cole-Sewell Engineering Co.	136	
Columbia Steel Co.	45	
Combustioneer	*	
Conco Engineering Works	17	
Condensation Engineering Corp.	116	
Connor Engrg. Co., W. B.	130	
Consolidated Industries, Inc.	*	
Coroaire, Inc.	14 & 15	
Cotta Transmission Corp.	127	
Crescent Tool Co.	*	
Crise Electric Mfg. Co., The	125	
Dahlgren Machine Works	134	
Damascus Steel Products Corp.	137	
Delco Products Division, General Motors Corp.	*	
Des Moines Stove Repair Co.	136	
Detroit Air Filter Co.	*	
Detroit Lubricator Co.	32	
Doyle Vacuum Cleaner Co.	127 and 138	
Dreis & Krump Mfg. Co.	135	
Dresser Industries (See Bryant Heater Co.)	*	
Effecto-Grille Co.	127	
Elgo Shutter & Mfg. Co.	*	
Enderle, Inc., Ltd., Frank X.	137	
Excel Htg. & Air Conditioning Co.	135	
Fairbanks-Morse & Co.	*	
Fameco Machine Co.	*	
Famous Furnace Co., The	139	
Field Control Div., H. D. Conkey & Co.	117	
Fireline Stove & Furnace Lining Co.	111	
Follansbee Steel Corp.	*	
Forest City Foundries Co.	135	
Frayn Co.	138	
Freeman Stoker Div., Illinois Iron & Bolt Co.	*	
Front Rank Furnace Co.	111	
Furblo Co.	132	
Gallagher Co.	137	
Gehl Bros. Mfg. Co.	*	
Gelert & Co., C. R.	94	
General Controls	37	
General Electric Co.	*	
Georgen-Mackwirth Co., Inc.	*	
Gerett Corp., M. A.	*	
Gleason-Avery, Inc.	108	
Grand Rapids Die & Tool Co.	*	
Hall-Neal Furnace Co.	23	
Handees Co.	*	
Harrington & King Perforating Co.	129	
Hart & Cooley Mfg. Co.	110	
Hasko Utilities Co.	138	
Heil Co.	103	
Henry Furnace Co., The	40	
Heremetall Co.	*	
Hess Warming & Ventilating Co.	116	
Hussey & Co., C. G.	*	
Illinois Testing Laboratories, Inc.	133	
Independent Pneumatic Tool Co.	*	
Independent Register Co.	117	
Interstate Machinery Co.	139	
Jackson & Church Co.	11	
Johns-Manville Corp.	*	
Johnson Company, S. T.	*	
Kimberly-Clark Corp.	*	
Knights Co., The James	131	
Krauser-Boyd, Inc.	134	
Kresky Mfg. Co.	115	
Krueger Sentry Gauge Co.	133	
Lakewood Engr. Co.	*	
Langenkamp Co., F.	135	
Lau Blower Co.	29	
Libert Machine Co.	*	
Lincoln Electric Co.	52	
Lockformer Co.	13	
Made-Rite Furnace Pipe & Fitting Co.	126	
Maid-O-Mist, Inc.	135	
Majestic Co.	132	
Majestic Flashing Company	133	
Maplewood	120	
Marshalltown Mfg. Co.	133	
Master Electric Co., The	*	
Maurey Mfg. Co.	*	
May-Fieberger Co.	124	
McDonnell & Miller	*	
Merco Corp., The	10	
Meyer & Bro. Co., F.	*	
Meyer Furnace Co.	7	
Milcor Steel Co.	78	
Miller & Doing	135	
Milton Equipment Co.	139	
Minneapolis-Honeywell Regulator Co.	*	
Morey, Dan	137	
Morrison Products, Inc.	*	
Morrison Steel Products, Inc.	105	
Mt. Vernon Furnace & Mfg. Co.	137	
Mueller Furnace Co., L. J.	21	
National Metal Fabricators	131	
National Super Service Co.	137	
Nelson Corp., Herman	26 and 27	
Niagara Machine & Tool Works	124	
Norge-Heat Div., Borg-Warner Corp.	*	
Norman Products Co., Inc.	123	
Northwestern Stove & Repair Co.	131	
Nu-Way Corp.	*	
Olsen Mfg. Co., C. A.	44	
Omaha Stove Repair Works	136	
Owens-Corning Fiberglas Co.	22	
Packard Elec. Div. General Motors Corp.	*	
Palmer Mfg. Co.	118	
Paragon Elec. Co.	128	
Parker-Kalon Corp.	109	
Peck, Stow & Wilcox Co.	119	
Peerless Foundry Co.	126	
Penn Boiler & Burner Mfg. Co.	*	
Penn Electric Switch Co.	47	
Penn Tool Co.	*	
Perfex Corp.	18	
Petroleum Heat & Power Co.	48	
Plasteel	104	
Pocahontas Fuel Co., The	28	
Potts, Son & Co., Inc., W. F.	138	
Premier Furnace Co.	33	
Pryne & Co., Inc.	*	
Pullen Stove & Furnace Repair Co.	134	
Randall Graphite Products Corp.	20	
Register & Grille Mfg. Co., Inc.	131	
Republic Steel Corp.	41	
Research Products Corp.	Outside Back Cover	
Revere Copper & Brass, Inc.	89	
Reznor Mfg. Co.	*	
Rheem Mfg. Co.	*	
Riverside Machine Company	*	
Rock Island Register Co.	134	
Royal Heaters, Inc.	12	
Rudy Furnace Co.	135	
Rybolt Heater Co.	19	
Ryerson & Son, Inc., Joseph T.	54	
Sall Mountain Co.	119	
Sampsel Time Control Co.	6	
Scheck, William	138	
Schwab Furnace Co.	*	
Shawab Safe Co.	*	
Schwitzer-Cummins Co.	122	
Sciaky Bros.	30	
Skuttle Mfg. Co.	128	
Smith, R. E.	154	
Standard Remote Control Valve Co.	16	
Standard Stamping and Perforating Co.	137	
Stanley Elec. Tool Div., The Stanley Works	*	
Stewart Mfg. Co.	*	
Stok-a-Fire Co.	*	
Sturtevant Co., B. F.	136	
Swartwout Co.	*	
Synromatic Corp.	5	
Tennessee Coal, Iron & R. R. Co.	45	
Timken-Detroit Axle Co.	46	
Tinit Mfg. Co.	137	
Topflight Tool Co.	139	
Triangle Mfg. Co.	114	
Union Mfg. Co.	*	
U. S. Air Conditioning Corp.	*	
United States Register Company	112	
United States Steel Corp.	45	
United States Steel Export Co.	45	
United States Steel Supply Co.	45	
Utility Appliance Co.	*	
Viking Air Conditioning Corp.	106	
Viking Mfg. Co.	36	
Vital Products Mfg. Co.	138	
Waterman-Waterbury Co.	66	
Wayne Home Equipment Co.	120	
Webster Electric Co.	25	
Weirton Steel Co.	35	
Wells Mfg. Co.	8	
Western Engrg. Co.	132	
Wheeling Corrugating Co.	49	
White Mfg. Co.	115	
White-Rogers Electric Co.	*	
Whiting Corp.	*	
Whitney Metal Tool Co.	128	
Whitney Mfg., W. A.	126	
Wise Furnace Co.	*	
Williams Oil-A-Matic Division, Eureka Williams Corp.	43	
Williams Radiator Co.	139	
Williams-Wallace Co.	*	
Williamson Heater Co.	31	
Wilson, Inc., Grant	34	
Wilson, K. R.	38 & 39	
Wodak Electric Tool Co.	138	
Wood Industries, Inc., Gar.	*	
Wolff & Co., Benjamin	Inside Back Cover	
Wysong & Miles Co.	24	
Zink, John, Co.	113	

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

119
126
*
47
*
18
48
104
28
138
33
*
134
20
131
41
k Cover
89
*
*
*
134
12
135
19
54
119
6
138
*
*
122
30
128
154
16
ing
137
ley
*
*
*
136
*
5
45
46
137
139
114
*
*
112
45
45
45
45
*
106
36
138
66
120
25
35
8
132
49
*
115
9
*
128
120
*
45
130
*
31
34
8 & 39
138
*
Cover
113
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